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Fauna en Flora

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PUBLIKASIE
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TRANSVAAL

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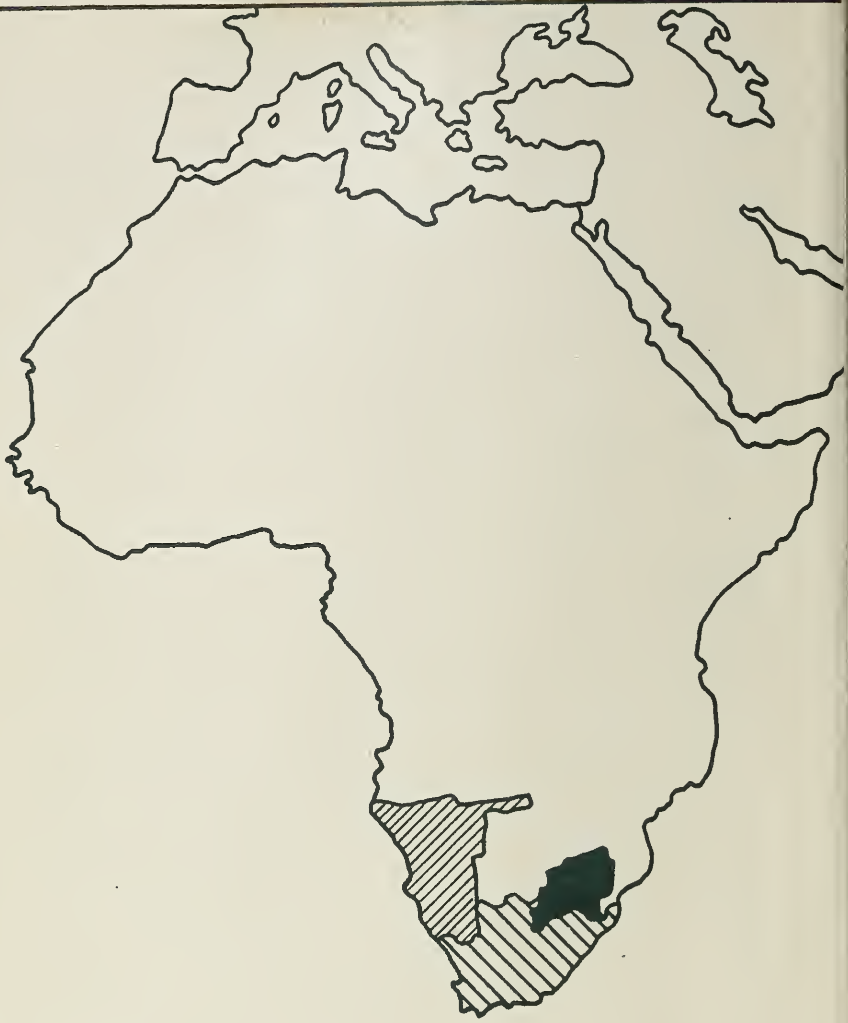

Die Oppervlakte van die Transvaal aangedui in vergelyking met die Unie van Suid-Afrika

▨ SUIDWES-AFRIKA (332,450 vk. myl)

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▧ KAAPPROVINSIE
ORANJE-VRYSTAAT
NATAL
} UNIE VAN SUID-AFRIKA (472,550 vk. myl)

FAUNA EN FLORA

'n offisiële publikasie van die Transvaalse Provinsiale Administrasie

an official publication of the Transvaal Provincial Administration

Dr. Wm. NICOL

Administrateur van Transvaal

VOORWOORD.

Die Afdeling Fauna en Flora is in 1947 *gestig op die aanbeveling van die Wildbeskermingskommissie,* 1945. *Die spontane hulp wat sedertdien van die publiek en veral van plaaseienaars ontvang is was van ontsaglike aanmoediging en hulp vir hierdie Administrasie in sy verdere pogings.*

Dit sal moontlik wees om alle aspekte van ons wildlewe te ontwikkel deur middel van moderne wetgewing oor wild, ongedierte en vis en die alreeds bestaande wetgewing oor florabeskerming.

Al die vraagstukke in verband met ons wild sal wetenskaplike aandag geniet op die plaas Panfontein. Dit sal nie slegs moontlik wees om 'n studie te maak van die natuur in sy ongeskonde natuurlike staat in ons provinsiale reserwes nie, maar fasiliteite sal ook daargestel word vir die genot daarvan deur beide ryk en arm.

Die talryke vraagstukke in verband met ons visserye en varswatervisse sal aangepak word by die visserye-instituut te Lydenburg en sy ondergeskikte stasies.

Die bevinding van die personeel sal van tyd tot tyd op 'n aantreklike wyse gepubliseer word in die tydskrif „ Fauna en Flora ".

In die eerste uitgawe word 'n opname gegee van ons Suid-Afrikaanse parke en reserwes. Hierdie uitgawe is 'n uitstekende begin en is ook van belang vir oorsese toeriste.

Wm. Nicol.

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WILDBEWARING
IN DIE UNIE VAN SUID-AFRIKA

deur

R. BIGALKE
Direkteur van die Nasionale Dieretuin, Pretoria

◆

HISTORIESE INLEIDING

TOE die eerste blanke nedersetters die Kaap die Goeie Hoop op 7 April van die jaar 1652(16) bereik het, het hulle 'n land gevind wat ryk bedeel was met 'n inheemse fauna en flora beide wat soorte en getalle betref. Gedurende die nag van 23 April 1652 het lede van J. van Riebeeck se geselskap 'n groot seekoei (*Hippopotamus amphibius*) doodgemaak in die moerasagtige gedeelte wat nou 'n deel van die stad van Kaapstad is.(16) Na die lang seereis van Holand af is die vars vleis van hierdie dier ten seerste geniet.

In sy dagboek skryf Van Riebeeck dat hartbeeste (*Alcelaphus caama*), elande (*Taurotragus oryx*) en steenbokke (*Raphicerus campestris*) volop was in die omgewing van die klein nedersettingkie.(16) Namate laasgenoemde aangegroei het, het wilde diere soos leeus, luiperds, hiënas en wildekatte begin skade aanrig onder die nedersetters se osse, skape en pluimvee. By een geleentheid is twee wagte wat by die nedersetting se beeskraal op wag was, ernstig verwond deur 'n luiperd.(16)

In die jaar 1669 was seekoeie nog volop in die Bergrivier waar baie deur jagters geskiet is vir voedsel vir die nedersetters. In dieselfde jaar is lisensies vir die eerste keer aan nedersetters uitgereik om hulle in staat te stel om grootwild te jag waar hulle wou.(16)

In die jaar 1685 het die Goewerneur van die Kaap die Goeie Hoop, Simon van der Stel, 'n ekspedisie na Namakwaland onderneem. Toe hierdie ekspedisie naby die Piketberg kom, dit wil sê ongeveer 100 myl van Kaapstad af, het 'n swartrenoster (*Diceros bicornis*) die Goewerneur se koets bestorm. Gelukkig was Van der Stel instaat om uit die koets te spring en die dier is afgeweer deur 'n geweerskoot.(16)

In die jaar 1702 is 'n Afrikaanse olifant (*Loxodonta africana*) naby die Kaapse Vlaktes digby Kaapstad geskiet maar teen 1740 het hierdie dier, die grootste landsoogdier in die wêreld, feitlik verdwyn van die bewoonde gebiede van die Kaap die Goeie Hoop af.(16 en 17) Die jag op seekoeie, renosters, buffels, elande en ander wildbokke het teen hierdie tyd so toegeneem dat hierdie diere in die bewoonde gedeeltes van die land begin skaars word het. Verder weg was wild van allerlei soorte egter nog verbasend volop.

In 1775 het die Sweedse wetenskaplike, Andreas Sparrman, groot troppe rooihartbeeste (*A. caama*) en Kaapse bergsebras (*Equus zebra zebra*) ten ooste van die Botrivier in die huidige Caledonse distrik aangetref. Op die vlaktes van die Groot Visrivier het hy springbokke (*Antidorcas marsupialis*), egte kwaggas (*Equus quagga quagga*) en rooihartbeeste (*A. caama*) in groot getalle gesien.(15)

In die jaar 1803 het Lichtenstein talryke troppe springbokke en ander soorte wildbokke en troppe egte kwaggas tussen die Sondags- en Boesmansrivier aangetref. Veral spring-

'n Trop Afrikaanse olifante in die oostelike Transvaal.
(Foto deur W. F. Schack.)

bokke was baie volop en die troppe het dikwels bestaan uit verskeie duisende diere uitgesprei sover as die oog kon sien.(10)

In September van die jaar 1835 het die groot noordwaartse uittog, bekend as die Groot Trek, begin met die emigrasie van Louis Trichardt en sy volgelinge. In daardie dae was die wêreld feitlik toe onder die wild, nie net in die Kaap die Goeie Hoop nie maar veral in die feitlik onbewoonde gebied waar die Voortrekkers hulle wou gaan vestig.

Volgens Theal(18) het die Voortrekkers voor September van die jaar 1837 minstens 249 leeus in die omgewing van Thaba 'Nchu in die huidige Oranje-Vrystaat geskiet. Dit is duidelike bewys van die talrykheid van die wild in die binneland van Suid-Afrika toentertyd, aangesien groot hoeveelhede leeus baie wild nodig gehad het om van te leef. Ongeveer 30 of 40 jaar later het leeus verdwyn van die gebied wat tans as die Oranje-Vrystaat bekend is.

In die jaar 1836 het die jagter en reisiger W. Cornwallis Harris groot aantalle springbokke in die Karoo ten suide van Graaff-Reinet aangetref. Die wild in die binneland van Suid-Afrika was in daardie dae so volop dat Harris op een plek in sy boek melding maak van 'n totale aantal van 15,000 blouwildebeeste (*Gorgon taurinus*), egte kwaggas (*E. q. quagga* en ander diere.(7)

Die mate waarin wild in Suid-Afrika gedurende die negentiende eeu deur jagters uitgeroei is, kan vasgestel word uit die syfers wat verskaf is deur W. C. Harris en W. C. Baldwin.

Harris het meer as vierhonderd stuks grootwild van verskillende soorte en grootte geskiet gedurende 'n tydperk van ongeveer ses maande wat hy in die binneland van Suid-Afrika deurgebring het gedurende die jare 1836-37.(7)

Tydens Baldwin se laaste jagtog na die Zambesirivier in die jaar 1860 het sy geselskap, wat uit vier jagters bestaan het, die volgende neergetrek: 61 Afrikaanse olifante, 11 witrenosters, 12 swartrenosters, 2 seekoeie, 11 kameelperde, 30 Afrikaanse buffels, 71 sebras, 4 leeus, 21 elande en 129 wildsbokke van verskillend soorte.(1)

Majoor P. J. Pretorius het gedurende sy leeftyd 557 Afrikaanse olifante geskiet(14) en daar is ongetwyfeld ander grootwildjagters wie se onbekende prestasies selfs hierdie syfers oortref.

Volgens Harris was die witrenoster (*Ceratotherium simum simum*) in sy tyd volop in die omgewing van die Marico- en die Krokodilrivier en die swartrenoster (*D. bicornis*) was baie algemeen in die binneland. By een geleentheid het hy minstens 22 witrenosters getel tussen sy waens en 'n koppietjie 'n half myl verder weg en hy het 4 van hulle geskiet. In 1895 het Kirby(9) 'n witrenosterkoei en 'n groot kalf in die Matamiri-bos (tans in die Nasionale Kruger-Wildtuin) langs die suidelike oewer van die Sabirivier aangetref. Kirby verklaar dat dit 'n lieflingsoord van hierdie soort renosters vir baie jare was, alhoewel dit dáár uiters seldsaam was in die jaar 1895 en heeltemal uitgesterf in 1896. Dit skyn die laaste aantekening te wees van die voorkoms van die witrenoster in Suid-Afrika buite die grense van Zoeloeland.

Selfs in die jaar 1860 was wild nog volop in die gebied wat tans die Oranje-Vrystaat is. Gedurende Augustus van daardie jaar is 'n groot jagparty ter ere van Prins Alfred op mnr. Andrew Bain se plaas Hartebeesthoek(19) ongeveer vyf myl van Bloemfontein af, georganiseer. Ongeveer 1,000 van Moroko se Barolong het die wild opgejaag en daar word geskat dat tussen twintig- en dertigduisend stuks grootwild op die vlaktes om mnr. Bain se woning saamgetrek was. In *The Friend* van 31 Augustus 1860, is gerapporteer dat ongeveer 800 tot 1,000 stuks blesbokke (*Damaliscus albifrons*), swartwildebeeste (*Connochaetes gnou*), springbokke (*A. marsupialis*), sebras en volstruise (*Struthio australis*) geskiet is. Fritsch(6) verklaar dat die Prins self 23 blesbokke op die betrokke dag omgepiets het.

Na byna drie eeue van nedersetting in die suide en na meer as honderd jaar se nedersetting in Transvaal is die toestand van Suid-Afrika se fauna tans radikaal verskillend. In die digter bewoonde gebiede het die meeste soorte wild feitlik heeltemal verdwyn, maar dwarsdeur die land is daar tans baie grondeienaars wat die wild op hulle plase beskerm en aanvul. Ander weer het daartoe oorgegaan om weer wild op hulle plase te kry. Dit lei geen twyfel nie dat, terwyl baie nog daarop uit is om wild te vernietig, ander vervul is met die idee om die wild te bewaar en hulle doen dit dan ook in die praktyk.

Die koms van die witman in Suid-Afrika het gelei tot die algehele uitroeiing van die bloubok (*Hippotragus leucophaeus*), die egte kwagga (*E. q. quagga*), die Kaapse leeu (*Felis leo melanochaitus*) en die tipiese soort Burchell se sebra (*E. burchellii burchellii*). Ander soorte soogdiere soos die Kaapse bergsebra (*E. zebra zebra*), die swartwildebees (*C. gnou*), die bontbok (*D. pygargus*), die Addo-olifant (*Loxodonta africana toxotis*), die Knysna-olifant (*L. a. subsp.?*), die witrenoster (*C. simum simum*), die swartrenoster (*D. bicornis*) en die oorbietjie (*Ourebia ourebi*) het baie skaars geword.

Gedurende die negentiende eeu het oordeelkundige persone begin besef dat, ten spyte van die groot getalle grootwild in Suid-Afrika, die vordering van beskawing sal uitloop op òf radikale vernietiging òf die algehele uitskakeling van hierdie diere tensy hulle uitroeiing op doeltreffende wyse aan bande gelê kan word.

Op 20 Januarie 1846 het die Ohrigstadse Republiek die volgende besluit aangeneem in verband met die uitroeiing van wild: „Dat stellig verboden word moetwilliege of onverschilliege vernielingen van bruikbare wild, tot voedzel dienende voor den mensch, om meer te doden dan men tot matig gebruik nodig heeft, nog om dat te doen alleen om de huiden.

Renosters is onder de bruikbare wild niet gerekend. Voor ieder overtreding zal de overtreder vervallen in een boete niet minder dan tien en niet te boven gaande riksdaalders vyfhonderd naar den aard der zaak."(13)

In die eerste wildwetgewing van die Suid-Afrikaanse Republiek wat op 22 September 1858 aangeneem is, word melding gemaak van die feit dat meedoënlose vernietiging van wild in baie distrikte van die republiek so'n skaarste aan wild ten gevolge gehad het „dat vele behoeftige ingezetenen dezer Republiek welhaast onder dat ongerief zullen moeten lijden ".(8) In artikel 9 van hierdie wet kom die volgende bepaling voor: „Dat niemand geregtigd zal zijn, meer wild op eenige wijze te doden dan hij volstrekt tot zijn consumptie nodig heeft, of op een wagen kan laden, of wild te doden alleen tot verkrijgen van de vellen."

Strenger wetgewing is van tyd tot tyd deur die verskillende state van Suid-Afrika aangeneem, maar al hierdie pogings om die fauna (en flora) te bewaar was min of meer van 'n akademiese aard, aangesien hulle mank gegaan het aan die tradisionele moeilikheid deurdat dit nie moontlik was om dit doeltreffend toe te pas nie.

Teen die einde van die negentiende eeu is beide in Transvaal en Zoeloeland oorgegaan tot die stigting van wildreserwes. Die Kaap die Goeie Hoop en Natal het ietwat later gevolg en die Oranje-Vrystaat nog later.

Op 30 Maart 1898 het President Stephanus Johannes Paulus Kruger, van die Suid-Afrikaanse Republiek, 'n proklamasie uitgevaardig tot die stigting van 'n Staatswildtuin in die Oostelike Transvaal tussen die Krokodil- en die Sabirivier. In 1903 is die Shingwedzi-wildreserwe ten noorde van die Groot Letabarivier toegevoeg en hierdie twee reserwes het die Unie se eerste nasionale park, die Nasionale Kruger-wildtuin, geword in die jaar 1926.

Die optrede vir die beskerming van die fauna van Suid-Afrika is aangevuur deur die verlange om iets van die land se vorige ongeloofbare oorvloed aan wild te red. In die begin is pogings aangewend om dit te doen deur die aantal stuks wild wat geskiet kon word te beperk, deur permanente beskerming vir seldsame soorte aan te bied en deur jag tot sekere tye van die jaar te beperk. Later is 'n verdere stap gedoen toe wildreserwes gestig is waarin wild gladnie geskiet kon word nie.

Voor 31 Mei 1910, die dag waarop die vier kolonies waaruit Suid-Afrika bestaan, naamlik die Kaap die Goeie Hoop, die Oranjerivier-kolonie, Natal en Transvaal, saamgesmelt is in die Unie van Suid-Afrika, is wildbewaring onafhanklik deur elke kolonie uitgevoer. Maar sedert daardie datum is elkeen van die vier Provinsiale Rade deur die Zuid-Afrika Wet van 1909 gemagtig om ordonnansies uit te vaardig vir vis- en wildbewaring ingevolge die bepalings van artikel 85 (X). Hierdie beperkende bevoegdhede is uitgebrei tot „die bewaring van flora en fauna " deur Proklamasie No. 212 van 1935 van die Unie-Regering, afgekondig op 18 Oktober 1935.

In elkeen van die vier provinsies van die Unie van Suid-Afrika word daar in die wildwette voorsiening gemaak vir die stigting van wildreserwes. Hulle word gestig deur middel van proklamasies wat deur die Administrateurs van die onderskeie provinsies afgekondig word. Daar is 'n inherente swakheid in hierdie metode om wildreserwes te skep, aangesien dit feitlik net so maklik is om 'n reserwe te stig as om dit te ontbind. Daar kan politieke of ander druk op die Provinsiale Administrasie uitgeoefen word om reserwes vir boerdery-doeleindes beskikbaar te stel en dit kan moeilik wees om sodanige druk te weerstaan.

In die jaar 1912 is druk op die Transvaalse Provinsiale Administrasie uitgeoefen om winterweiding te voorsien in die sogenaamde „buffergebied " of „Pretorius Kop-gebied " van die Sabi-wildreserwe, tans die suidelike gedeelte van die Nasionale Kruger-wildtuin.(23) In die jare 1913, 1914 en 1917 het die Transvaalse

Provinsiale Administrasie toegegee aan hierdie druk en toegelaat dat skape, bokke, donkies, muile en perde op sekere voorwaardes hier kon wei, maar beeste is uitgesluit.(²³)

Dit is duidelik dat wildreserwes wat ingevolge die bepalings van die Provinsiale Wildordonnansies gestig word, nie net so permanent kan wees as nasionale parke wat ingevolge die Unie se Wet op Nasionale Parke, No. 56 van 1926 gestig word nie.

NASIONALE PARKE

ALGEMEEN

(*a*) Keuse van Nasionale Parke.

In die Unie van Suid-Afrika is totnogtoe geen vaste prosedure vir die keuse van nasionale parke aanvaar nie. Hierdie taak is nog aan geen spesiale liggaam toevertrou nie en dit skyn nie asof wetenskaplike advies te eniger tyd ingewin is nie.

Die Nasionale Kruger-wildtuin is die opvolger van die Sabi- en Shingwedzi Wildreserwe wat oorspronklik onderskeidelik in die jare 1898 en 1903 gestig is. Daar word tans moeilikheid ondervind met die westelike grens van die Nasionale Kruger-wildtuin weens die feit dat hierdie grens nie 'n biologiese grens is nie maar gedeeltelik 'n historiese en gedeeltelik 'n gerieflikheidsgrens.

In die geval van die Nasionale Addo-olifantepark is daar ook moeilikheid ondervind omdat biologiese oorwegings geheel en al buite rekening gelaat is toe die grense van hierdie Park vasgestel is.

(*c*) Sentralisasie van Nasionale Parke-administrasie.

Daar bestaan niks in Suid-Afrika wat kan vergelyk word met die Nasionale Parkediens van die Verenigde State op die gebied van natuurbeskerming nie. Maar daar is 'n sekere mate van sentralisasie in die geval van die Unie se nasionale parke, aangesien die Raad van Kuratore van Nasionale Parke alle bestaande nasionale parke kontroleer en administreer uitgesonderd die Koninklike Natalse Nasionale Park en die Wildtuin Giant's Castle, wat beheer word deur die Raad vir die Bewaring van Natalse Parke-, Wild- en Vis.

PROVINSIE TRANSVAAL

I—NASIONALE PARKE

NASIONALE KRUGER-WILDTUIN.

Op die oomblik is daar slegs een nasionale park in die Provinsie Transvaal, naamlik die Nasionale Krugerwildtuin. Hierdie park is op 15 September 1926 gestig en is beide die oudste en die grootste nasionale park in die Unie van Suid-Afrika wat ingevolge die Wet op Nasionale Parke gestig is. Dit is in die Laeveld van Oos-Transvaal langs die Lebomboberge aan die westekant geleë en strek van die Krokodilrivier in die suide tot by die Pafuririvier in die noorde. Die huidige oppervlakte van die Nasionale Kruger-wildtuin is ongeveer 5,097,004 *acres* (ongeveer 7,964 vierkante myl).

Sedert die stigting van die Nasionale Kruger-wildtuin is sy oppervlakte vergroot deur die skenking van die volgende plase deur mev. Eileen Orpen, die welbekende weldoenster van wild in Suid-Afrika: —

Naam en Nommer van Plaas.	Oppervlakte.	Datum van Inlywing in die Nasionale Kruger-Wildtuin.
	Acres.	
1. Chalons No. 229	11,098·8	10 April 1935.
2. Kingfisherspruit No. 406	10,341·0	7 Februarie 1941.
3. Redgorton No. 126	9,943·6	7 Februarie 1941.
4. Blackberry Glen No. 154	8,765·0	12 Junie 1942.
5. Hengel No. 121	2,056·9	12 Junie 1942.
6. Sikkeltouwkloof No. 153	10,007·9	12 Junie 1942.
7. Houtboschrand No. 87	8,398·0	25 Februarie 1944.
TOTAAL	60,611·2	

Ander plase wat in die Nasionale Kruger-wildtuin sedert sy stigting ingelyf is, is die volgende: —

Naam en Nommer van Plaas.	Oppervlakte.	Datum van Inlywing in die Nasionale Kruger-Wildtuin.
	Acres.	
1. Zeekoegat No. 4	3,615·4	10 April 1935.
2. Knaboomkop No. 5	3,324·9	10 April 1935.
3. Middelin No. 106	1,129·4	10 April 1935.
4. Batavia No. 298	9,107·2	10 April 1935.
5. Vereeniging No. 3	5,852·8	3 September 1937.
6. Dargai No. 403	4,470·9	28 Januarie 1938.
7. Alma No. 453	9,196·0	28 Januarie 1938.
TOTAAL	36,696·6	

Alhoewel die Nasionale Krugerwildtuin 'n betreklike nuwe instelling is, het die fauna (en flora) van die suidelike gedeelte van hierdie Park vir ongeveer 28 jaar voor sy stigting beskerming geniet toe dit bekend was as die Sabi-wildreserwe. Laasgenoemde is oorspronklik gestig by 'n proklamasie (No. R. 8747/95) uitgevaardig deur President S. J. P. Kruger en gepubliseer in die „Staatscourant der Z.A. Republiek" op 30 Maart 1898.

(*a*) OMVANG VAN BESKERMING.

In die eerste paragraaf van die Wet op Nasionale Parke, No. 56 van 1926, word verklaar dat die Nasionale Kruger-wildtuin gestig is „vir die voortplanting, beskerming en behoud daarin van wilde dierelewe, wilde plantegroei en voorwerpe van geologiese, etnologiese, historiese of ander wetenskaplike belang, in die belang en tot voordeel en genot van die inwoners van die Unie."

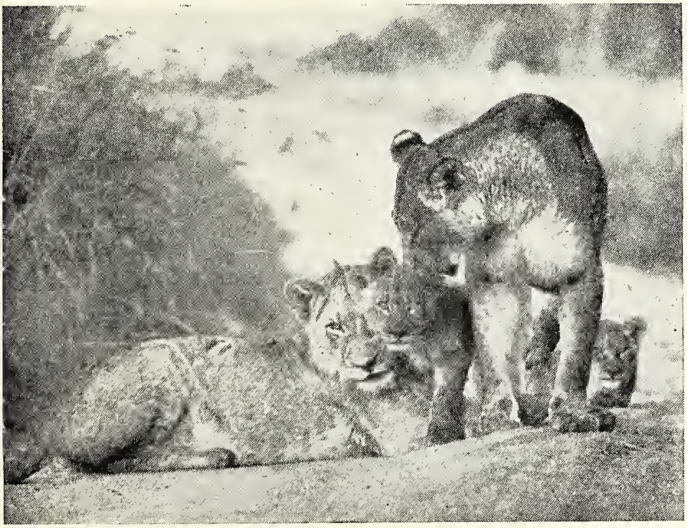
Dit is duidelik uit hierdie verklaring dat dit die bedoeling was met hierdie wetgewing dat alle soorte diere wat in die Nasionale Kruger-wildtuin gevind word, beskerming moet geniet. Ongelukkig is die woordomskrywing van die woord „dier" in die Wet onbestaanbaar met die doelstellings soos in die eerste paragraaf van die Wet uiteengesit, met die gevolg dat sulke groepe soos *Amphibia, Mollusca, Crustacea* en ander ongewerwelde diere geen wetteregtelike beskerming in die Kruger-Wildtuin geniet nie.

Paragraaf 21 van die Wet op Nasionale Parke sê dat daar nie op grond wat in 'n nasionale park geleë is, „na minerale geprospekteer of gemyn mag word nie", maar voorsiening word gemaak vir „regte wat iemand voor die inwerkingtreding van hierdie Wet wettig verkry het".

Eienaardig genoeg verbied die Unie se Wet op Nasionale Parke nie die invoering van uitheemse diere of plante in die Unie se nasionale parke nie—dit word inderdaad toegelaat ingevolge artikel 12 (3) van die Wet.

(*b*) ADMINISTRASIE.

Ingevolge artikel 5 van die Wet op Nasionale Parke, is die beheer en bestuur van nasionale parke toevertrou aan 'n raad van kuratore bekend as die Raad van Kuratore vir Nasionale Parke bestaande uit tien lede. Elke Administrateur van 'n provinsie waarin 'n nasionale park geleë is en die Wildbeskermingsvereniging van Suid-Afrika is elk geregtig om een lid



'n Leeufamilie in die Nasionale Kruger-wildtuin.

(Foto deur Dick Wolff.)

Gevlekte Hiëna (Crocuta crocuta) *in die Nasionale Kruger-wildtuin.*
(Foto deur Dick Wolff.)

te nomineer om benoem te word in die Raad. Die origë lede word deur die Minister van Lande self benoem.

Al die lede van die Raad dien in 'n ere-hoedanigheid maar reis- en verblyfkoste word aan hulle terugbetaal terwyl hulle in offisiële diens is.

Die Raad stel sy eie personeel aan en is gemagtig om salarisse, lone en toelaes na goeddunke vas te stel.

Die hoofkantoor van die Raad van Kuratore vir Nasionale Parke is in Pretoria en die organisasie is as volg: —

(1) Raad van Kuratore.
(2) Sekretaris (die administratiewe hoofamptenaar).
(3) Klerklike personeel.

In die Nasionale Kruger-wildtuin bestaan die administrasie uit die volgende amptenare met hoofkwartier te Skukuza: —

(1) Opsiener van die Nasionale Kruger-wildtuin (die hoofamptenaar in hierdie park).
(2) Veldwagters (blanke en naturelle).
(3) Klerklike personeel.
(4) Werktuigkundige en bou-ambagsmanne.
(5) Ruskamppersoneel.

N.B.—'n Bioloog is nou ook aangestel.

(*c*) FONDSE VIR ONDERHOUD.

Die Raad se inkomste word verkry uit die volgende bronne: Staatstoelae, toelaes van die Provinsiale Administrasie van Transvaal en die Kaap die Goeie Hoop, permitgelde (om die parke binne te kom), verblyfgelde (gebruik van rushutte, beddegoed, ens.), lewenslidmaatskapsgelde, spesiale toelaes, boetes vir oortredings van die regulasies, skenkings en erflatings en inkomste wat uit konsessies verkry word.

(*d*) Publieke ondersteuning.

Gedurende die tydperk van twee-en-twintig jaar het die Nasionale Kruger-wildtuin 'n geliefkoosde wintervakansie-oord vir reisende motoriste geword. Die omvangryke gebruik wat van hierdie nasionale park gemaak word, word op die beste wyse aangedui op die volgende tabel wat die aantal besoekers aandui gedurende die toeristeseisoen van die begin af tot in die jaar 1948:—

Jaar.	Aantal Motorkarre toegelaat.	Aantal Besoekers in Toeriste Seisoen.
1927	3	Geen register gehou nie.
1928	180	Geen register gehou nie.
1929	850	Geen register gehou nie.
1930	1,700	Geen register gehou nie.
1931	2,500	Geen register gehou nie.
1932	3,023	Geen register gehou nie.
1933	4,017	Geen register gehou nie.
1934	5,431	19,740
1935	6,722	24,805
1936	7,936	29,334
1937	9,058	33,849
1938	9,891	38,014
1939	8,533	32,603
1940	5,978	22,525
1941	8,729	34,168
1942	Gesluit uit	gesonderd P.K.-gebied.
1943	Gesluit uit	gesonderd P.K.-gebied.
1944	Gesluit uit	gesonderd P.K.-gebied.
1945	Gesluit uit	gesonderd P.K.-gebied.
1946	9,150	37,166
1947	9,406	36,556
1948	12,260	46,753

(*e*) Huisvesting vir toeriste.

Die Wet op Nasionale Parke maak voorsiening vir die oprigting van hotelle in nasionale parke (artikel 12), maar dit is te betwyfel of hotelle ooit binne die Nasionale Kruger-wildtuin gebou sal word. Die soort huisvesting wat in hierdie park verkies word, is rushutte wat in ruskampe gekonsentreer is. Die rushutte is òf rondawels òf reghoekige hutte. Die rondawels is nageboots van naturellehutte. Dit is ronde hutte wat gebou is van òf stene òf van houtpale wat met dagha toegesmeer is en grasdakke het. In sommige ruskampe is daar 'n reeks van twee, drie of meer reghoekige hutte wat langs mekaar staan. In verskeie kampe is daar hutte wat van voorafgegote hol betonblokke gebou is met sinkdakke wat teen die son beskerm word deur dun houtlatjies. „Luukse hutte" word voorsien in die Skukuza- en Pretorius Kop-ruskampe en gedurende tye van drukte word nagmaaltipe-tente beskikbaar gestel.

(*f*) Die werking van konsessies.

In die vernaamste ruskampe is restaurants en winkels gebou. Die Raad vra publieke tenders vir hierdie konsessies.

(*g*) Seisoene.

Weens die gevaar van malaria, word slegs die Pretorius Kop-gedeelte van die Nasionale Kruger-wildtuin dwarsdeur die jaar oopgestel. Die orige en grootste gedeelte van die Park is slegs gedurende die wintermaande oop, d.w.s. gewoonlik van 16 Junie tot 15 Oktober.

(*h*) Bereikbaarheid.

Die meeste besoekers gebruik hulle private motorkarre om die Nasionale Kruger-wildtuin te besoek. Sommige huur motorkarre te Nelspruit of Witrivier.

Die Suid-Afrikaanse Spoorweë reël toere wat bekend is as die „Deur-in-nege". Die reisplan van so'n toer maak voorsiening vir 'n verblyf van ongeveer 'n dag en 'n half in die Kruger-wildtuin.

(*i*) Opvoedkundige werk.

Tot op die oomblik is daar geen opvoedkundige werk in die Nasionale Kruger-wildtuin gedoen nie.

(*j*) Navorsingsprogramme.

Daar is totnogtoe geen poging aangewend deur enige universiteit, kollege, museum of ander wetenskaplike liggaam om georganiseerde navorsingswerk in die Nasionale Kruger-wildtuin uit te voer nie, ook is daar geen wetenskaplike opnames van die fauna, flora, geologie en ander kenmerke van die park onderneem nie. Die enigste verhandelings wat totnogtoe gepubliseer is, skyn die volgende te wees:—

(1) A Preliminary List of the Plants found in the Kruger National Park, deur A. A. Obermeijer. *Annals of the Transvaal Museum,* Vol. XVII, Deel 4, 1937.

(2) Kruger Park Birds, deur L. Gill. "The Ostrich", Vol. IX, No. 2, Desember, 1938.

(3) A Note on Quantitative Methods in the Observation of Big Game in the Kruger National Park, deur D. H. S. Davis. *S.A. Journal of Science,* Vol. XXXVI, Desember 1939.

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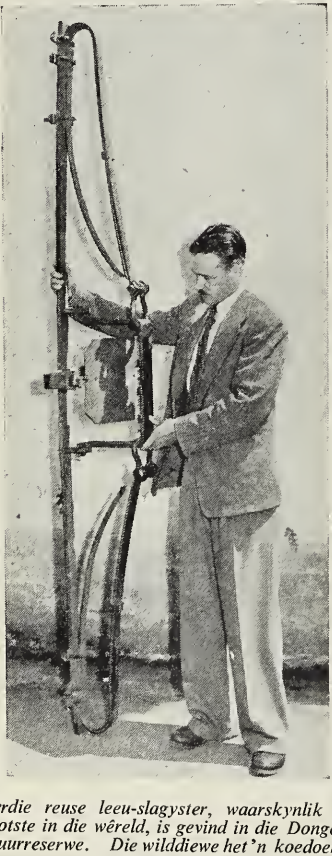

Hierdie reuse leeu-slagyster, waarskynlik die grootste in die wêreld, is gevind in die Dongola-natuurreserwe. Die wilddiewe het 'n koedoekop as aas gebruik.

(Rand Daily Mail.)

Mnr. S. A. Lombard, Provinsiale Sekretaris en Voorsitter van die Transvaalse Wildkommissie (1945).

(Foto deur Martin Gibbs.)

II—DONGOLA-NATUURRESERWE

Voorsiening vir die stigting van hierdie reserwe, in die vallei van die Krokodil- of Limpoporivier in Noord-Transvaal, is gemaak deur Wet No. 6 van 1947 wat op 1 November 1947 in werking getree het. Die kontrole van hierdie reserwe is toevertrou aan 'n raad van kuratore wat bekend is as die Raad van Kuratore vir die Dongola-reserwe.

Die grootte van die Dongola-natuurreserwe soos omskryf in Wet No. 6 van 1947, is 207,875·1 *acres* (325 vierkante myl), maar die Wet maak voorsiening vir die toevoeging van grond tot die reserwe en op 9 Januarie 1948 is die volgende Kroongrond, wat alles in die Magistraatsdistrik van Zoutpansberg geleë is, tot die Dongola-natuurreserwe toegevoeg:—

Plaas.	*Acres.*
Armenia No. 597	2,287·9
Anglican No. 602	3,026·5
Hilda No. 601	2,798·9
Belvedere No. 739	7,399·1
TOTAAL	15,512·4

Die grootte van die Dongola-natuurreserwe ten tyde van sy afskaffing was dus 223,387·5 *acres* (349 vierkante myl).

Die Dongola-natuurreserwe is op 10 Junie 1949 afgeskaf deur die Herroepingswet op die Dongola-natuurreserwe No. 29 van 1949 (sien Proklamasie No. 145 van 1949).

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III—WILDRESERWES

Die volgende Wildreserwes bestaan in die Provinsie Transvaal:—

(*a*) PROVINSIALE WILDRESERWES.

Naam.	Oppervlakte.	Datum van Stigting.
	Acres.	
1. Pafuri Wildreserwe (Dist. Zoutpansberg)	Ongeveer 40,639·0	5 Julie 1933.
2. Rust-der-Winter Wildreserwe. (Dist. Bronkhorstpruit)	13,462·0	29 Desember 1937.
3. Marico Bosveld Wildreserwe. (Dist. Marico)	Ongeveer 17,257·0	29 Desember 1937.
4. Honnet Wildreserwe (Dist. Zoutpansberg)	4,700·5	18 Januarie 1939.
5. Vaal-Hartz Wildreserwe (Distrikte Vereeniging en Heidelberg)	Ongeveer 63,283·0	5 April 1939.
6. Loskop Wildreserwe (Distrikte Middelburg en Witbank)	Ongeveer 30,000·0	6 Maart 1940. (Grense heromskryf op 7 Augustus 1940 deur Prok. No. 154 van 1940.)
7. Barberspan Wildreserwe (Dist. Delareyville)	?	13 April 1949.

Die Transvaalse Provinsiale Administrasie het 'n eksperimentele wildstasie op die plaas Panfontein naby Bloemhof gestig. Alhoewel Panfontein nie 'n geproklameerde reserwe is nie, het dit dieselfde status.

Die Pafuri-wildreserwe is op 5 Julie 1933 deur die Administrateur van Transvaal gestig (Proklamasie No. 43 van 1933) ingevolge die bepalings van artikel 3 van die „ Game Preservation Ordinance, 1905 ", maar die proklamasie is weer in 'n gewysigde vorm gepubliseer op 12 July 1933. Die orige ses reserwes is eweneens by proklamasies uitgevaardig deur die Administrateur ingevolge die bepalings van artikel van 2 van die Wildordonnansie, No. 11 van 1935. Daar word nie toegelaat om in hierdie reserwes te jag sonder die spesiale skriftelike toestemming van die Administrateur nie.

Afgesien van die feit dat wild in hierdie reserwes beskerm is, word daar tot dusver nog geen fasiliteite vir toeriste voorsien soos ons vind in die geval van die Unie se nasionale parke nie. Dit is haas onnodig om toe te voeg dat geen opvoedkundige of wetenskaplike werk in hierdie reserwes gedoen is nie.

Weens die feit dat die Pafuri Wildreserwe die noordelikste uitbreiding van die Nasionale Kruger-wildtuin is, is hierdie reserwe voorlopig onder die toesig van die Raad van Kuratore vir Nasionale Parke geplaas.

Versameling van vissoorte in die Pafuririvier.

(Star.)

Op 25 Maart 1948 het die Konservator van Fauna en Flora van die Provinsie Transvaal twee sebra-hingste en vyf merries van Noord-Transvaal (*E. b. transvaaliensis*?) in die Loskop-wildreserwe vrygelaat en op 30 April 1948 is een paar blouwildebeeste (*G. taurinus*), wat deur die Raad van Kuratore van die Nasionale Dieretuin geskenk is, ook in die Reserwe vrygelaat. Die Raad van Kuratore van die Nasionale Dieretuin het ook 'n rietbokram en -ooi (*Redunca arundinum*) geskenk en hulle is op 1 Julie 1948 in die Loskop-wildreserwe geplaas. Op laasgenoemde datum is daar 'n paar volstruise (*S. australis*) en 'n blouwildebeesbul (*G. taurinus*) wat deur die Johannesburgse Dieretuin geskenk is, ook in die Loskop Wildreserwe vrygelaat.

(*b*) MUNISIPALE WILD-RESERWES

Die volgende vier reserwes is die eiendom van Munisipale Rade en is deur die Administrateur van Transvaal geproklameer:—

Naam.	Gebied.	Datum van stigting.
	Acres.	
1. Dorpsgronde van Pretoria en Plaats Groenkloof (de Fonteinen), Reserwe	Ongeveer 17,122	1 Februarie 1895. Hergeproklameer op 9 Mei 1913
2. Rietvalleise Reserwe vir Wild en Inheemse Flora (Distrik Pretoria)	Tans 9,746	2 Junie 1937 (en 1 September 1948)
3. Wonderboomse Reserwe vir Wild en Inheemse Flora (Distrik Pretoria)	Ongeveer 296	28 Desember 1949.
4. Die Westdene Panse Reserwe vir Wild en Inheemse Flora (Dorp Benoni Westelike Uitbreiding No. 4.)	?	8 Februarie 1950.

Van hierdie reserwes word die eerste drie deur die Stadsraad van Pretoria geadministreer met behulp van die Pretoriase Raad van Advies insake Reserwes.

Die fondse wat vir ontwikkeling nodig is, word van tyd tot tyd deur die Stadsraad van Pretoria deur bemiddeling van die Stad se begroting beskikbaar gestel.

1. DORPSGRONDEN VAN PRETORIA EN PLAATS GROENKLOOF (DE FONTEINEN) RESERWE.

Die grootte van hierdie reserwe is ongeveer 17,122 *acres*.

Gedurende die afgelope jare het die Stadsraad van Pretoria baie gedoen om die Fonteine-gedeelte van hierdie Reserwe as 'n plesieroord vir sy inwoners te ontwikkel. Gedurende die loop van meer as 'n halwe eeu het daar nywerheids- en ander ontwikkeling op die Dorpsgronden en Plaats Groenkloof Reserwe plaasgevind met die gevolg dat daar op die oomblik slegs ongeveer 'n helfte daarvan nog nie beset is nie. Afgesien van voëls en klein nagtelike soogdiere, is daar tans min wild in hierdie Reserwe te vind.

Die mense van Pretoria en elders maak ontsaglik veel gebruik van die Fonteine-deel veral gedurende naweke, wanneer baie piekniekpartye daar aangetref word. 'n Restaurant en 'n swembad is daar gebou. Sommige mense bring hulle tente en kampeer vir korter of langer tydperke.

Die Stadsraad onderhou 'n busdiens na die Fonteine. Hierdie gedeelte van die Reserwe is ook maklik bereikbaar van die spoorlyn tussen Pretoria en Johannesburg af.

Daar word geen opvoedkundige of wetenskaplike werk in hierdie Munisipale Wildreserwe gedoen nie.

2. DIE RIETVALLEISE RESERWE VIR WILD EN INHEEMSE FLORA.

Die Rietvalleise Reserwe vir Wild en Inheemse Flora is ongeveer twaalf myl suidoos van Pretoria geleë. Ten tyde van sy stigting was die oppervlakte 11,185 *acres* maar aangesien 'n gedeelte van die grond in die tussentyd aan die Regering verkoop is, is die

Die Loskopwildreserwe word weer van Blouwildebeeste voorsien.

(Foto deur W. F. Schack.)

huidige oppervlakte van die Reserwe 9,746 acres. Die gebied is deur die Stadsraad van Pretoria verkry met die doel om die Rietvallei-dam daarop te bou wat een van die bronne van Pretoria se watervoorraad is.

In die Rietvalleise Reserwe vir Wild en Inheemse Flora is 'n trop van ongeveer 400 blesbokke (*Damaliscus albifrons*). Hulle is afstammelinge van 67 blesbokke wat deur Veldmaarskalk J. C. Smuts geskenk is en wat gedurende Augustus 1938 deur mnr. A. Weyers van Gen. Smuts se plaas Doornkloof oorgejaag is. Daar is ook 'n klein troppie van ongeveer 12 springbokke (*A. marsupialis*) en kleinwild sowel as wilde voëls is volop. Onder die kleiner soorte wildbokke wat in die Rietvalleise Reserwe voorkom, is daar die steenbok (*R. campestris*), die grysduiker (*Sylvicapra grimmia*), die oorbietjie (*O. ourebi*) en die rooiribbok (*Redunca fulvorufula*).

Op die oomblik is die Reserwe nie vir die publiek oopgestel nie, maar die Pretoriase Raad van Advies insake Reserwes het 'n verslag aan die Stadsraad van Pretoria voorgelê waarin hulle voorstel dat die Reserwe as 'n plattelandse ontspanningsoord ontwikkel word. Die vernaamste aanbevelings is as volg:—

(*a*) Op voorwaarde dat bevredigende voorsiening teen die besoedeling van die water gemaak kan word, behoort die Reserwe oopgestel te word vir die publiek met die doel om daar piekniek te hou, te hengel en met bootjies op die dam te vaar onderworpe aan sodanige verordeninge as wat die Raad nodig ag.

(*b*) Die hele Reserwe moet met jakkalsdraad toegekamp word.

(*c*) 'n Sirkelpad moet aangelê word op so'n wyse om die besoekers in staat te stel om die blesbokke en springbokke te sien en wat deur die interessantste gedeeltes van die Reserwe sal moet gaan.

(*d*) Piekniek moet toegelaat word onderworpe aan beheer. Weens die gevaar van veldbrande moet fasiliteite voorsien word om vuur te kan maak op bepaalde plekke.

(*e*) Daar moet behoorlike toesig wees om vernietiging van diere en plante te verhoed.

(*f*) 'n Langtermyn-beleid om geskikte inheemse bome aan te plant, moet ingevoer word.

Gedurende die tydperk 26 Februarie 1939 tot 3 Februarie 1940 het amptenare van die Soölogiese Opname (Onderstepoort) studies uitgevoer op Rietvallei, maar geen rapporte is tot dusver gepubliseer nie.

Die Rietvalleise Wildreserwe is op 1 September 1948 tot 'n Inheemse Flora-reserwe geproklameer by Proklamasie No. 205 (Administrateurs-) 1948.

3. DIE WONDERBOOMSE RESERWE VIR WILD EN INHEEMSE FLORA.

Die Wonderboomse Reserwe vir Wild en Inheemse Flora soos gestig deur Proklamasie No. 255 van 28 Desember 1949, beslaan 'n oppervlakte van ongeveer 296 *acres* en is heeltemal ingekamp. Dit is deur die Stadsraad van Pretoria gestig hoofsaaklik vir die doel om die beroemde Wonderboom (*Ficus pretoriae*) te beskerm. Die boom bestaan tans uit 'n groep van *F. pretoriae* wat vegetatief ontwikkel het uit die oorspronklike boom.

In die Wonderboomse Reserwe vind ons sulke soogdiere soos die gewone bobbejaan (*Papio ursinus*), die grysduiker (*S. grimmia*), die steenbok (*R. campestris*), die dassie (*Procavia capensis*), die rooihaas (*Pronolagus randensis*) en baie kleiner soorte. Voëls word algemeen aangetref en wyle dr. Austin Roberts van die Transvaalse Museum het 'n lys van minstens 159 soorte en ondersoorte saamgestel. Baie soorte wilde voëls eet die klein vye wat die vrugte van die Wonderboom is.

Die Wonderboomse Reserwe vir Wild en Inheemse Flora is dwarsdeur die jaar oop en daar is fasiliteite vir piekniekgangers. Mettertyd sal verdere fasiliteite ongetwyfeld deur die Stadsraad voorsien word.

Wat die opvoedkundige sy aanbetref, kan daar verklaar word dat 'n natuurpaadjie deur die Stad se Direkteur van Parke aangelê is. Die Pretoriase Raad van Advies insake Reserwes is voornemens om 'n handboek uit te gee wat gaan oor die fauna, die flora, die geologie en ander kenmerke van die Reserwe.

Die Wonderboomse Reserwe vir Wild en Inheemse Flora skyn die enigste Reserwe in die Unie van Suid-Afrika te wees waar 'n aanvang gemaak is met opvoedkundige werk.

DIE KAAP DIE GOEIE HOOP

I—NASIONALE PARKE

Die volgende nasionale parke bestaan in die Provinsie van die Kaap die Goeie Hoop, algemeen bekend as die Kaapprovinsie: Die Nasionale Addo-olifantepark (Afdelings van Alexandria en Uitenhage), die Nasionale Bontebok-park (Afdeling van Bredasdorp), die Nasionale Kalahari-Gemsbokpark (Afdeling van Gordonia) en die Nasionale Bergsebrapark (Afdeling van Cradoek). Al hierdie nasionale parke word geadministreer en beheer deur die Raad van Kuratore vir Nasionale Parke. Die fauna, flora, geologiese en ander kenmerke van hierdie parke word op dieselfde wyse as die Nasionale Kruger-wildtuin beskerm.

1. DIE NASIONALE ADDO-OLIFANTEPARK.

Die Nasionale Addo-olifantepark is op 3 Julie 1931 gestig ingevolge artikel 2 van die Wet op Nasionale Parke (No. 56 van 1926), met die spesiale doel om die oorblyfsels van die Addo-olifant (*Loxodonta africana toxotis*) te beskerm aangesien daar tans slegs agtien stuks daarvan oor is (1947). Toe die Nasionale Park gestig is, was daar elf Addo-olifante in daardie gebied.

Gedurende 'n tydperk van elf maande wat majoor P. J. Pretorius in die Addo-bos deurgebring het gedurende die jare 1919-20 het hy „ongeveer honderd-en-twintig" Addo-olifante geskiet.([14]) Hy is deur die Provinsiale Raad van die Kaap die Goeie Hoop aangestel om hierdie taak te verrig weens die feit dat die olifante baie skade op naburige plase aangerig het. As gevolg van proteste beide van binne en buite Suid-Afrika, is die slagting gestaak toe daar nog sestien Addo-olifante oorgebly het.([14])

Gedurende die jare 1935 en 1936 is nog grond aan die Nasionale Addo-olifantepark toegevoeg sodat die totale oppervlakte tans 16,925·2 *acres* is.

Benewens die Addo-olifante is daar 'n trop van ongeveer 200 Kaapse buffels (*Syncerus caffer*) in die Nasionale Addo-olifantepark en bosvarke (*Potamochoerus koïropotamus*), bosbokke (*Tragelaphus scriptus*), klein wildbokke en ander soogdiere kom ook voor. Volstruise (*S. autralis*) kom ook voor onder die Park se avifauna.

(*a*) SEISOEN.

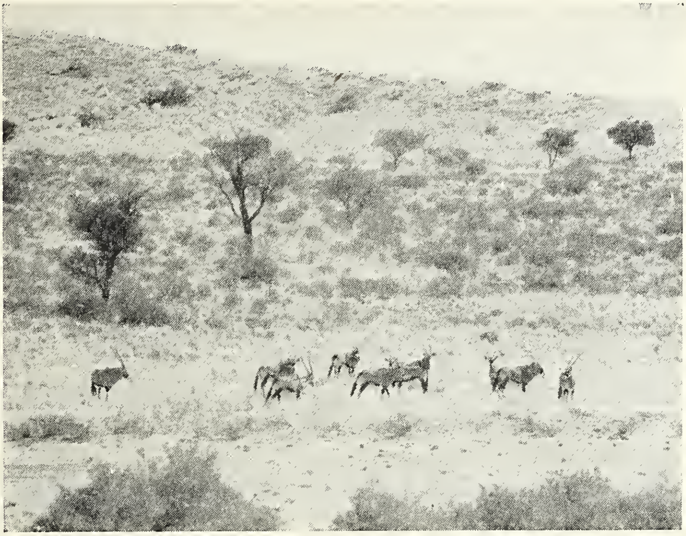
Daar is 'n blanke veldwagter in die Nasionale Addo-olifantepark gestasioneer en hy sorg vir die besoekers. Op die oomblik is die Park vir die publiek gesluit, maar voorheen het die seisoen gestrek van 1 Julie tot 31 Oktober en besoekers was in staat om die Addo-olifante waar te neem in die aand op 'n voerplek naby die veldwagter se woning. Dáár is olifante gedurende die sitrusseisoen gevoer op uitskotlemoene wat deur die Sundays River Citrus Co-operative Company voorsien is. Toeriste kan die olifante betrag uit 'n spesiale waarnemingstoring met behulp van soekligte.

'n Sirkelpad is aangelê en windpompe is in die Park opgerig. 'n Geëlektrifiseerde heining is opgerig met die doel om die olifante binne die grense van die Park te hou. Ongelukkig wei hulle soms tot op naburige plase waar hulle die toorn van die boere op die hals haal. Dit skyn asof die wanderlust van die Addo-olifant gestimuleer word wanneer die turksvye (*Opuntia* spp.) van daardie gebied begin ryp word.

(*b*) PUBLIEKE ONDERSTEUNING.

Aangesien dit 'n klein nasionale park is, en sy vernaamste bewoners gewoonlik gedurende 'n kort verblyf gesien kan word, is spesiale huisvesting vir besoekers nie nodig nie.

Gedurende die jaar 1941 het meer as 500 mense die Addo-park besoek maar daarna is die Park tydelik vir toeristeverkeer gesluit. In die verlede is baie toeriste getrek uit passasiers-



Gemsbokke (Oryx gazella) *in die Nasionale Kalahari-Gemsbokpark.*

(Foto deur Dick Wolff.)

bote wat te Port Elizabeth aangedoen het aangesien die Park slegs ongeveer veertig myl met die pad van Port Elizabeth af is. Gedurende die grootste gedeelte van die oorlog het petrolbeperkings baie moontlike toeriste verhoed om die Addo-park te besoek. Daar word verwag dat die ondersteuning van die Park sal toeneem wanneer dit weer geopen word en wanneer seereise weer tot normaal terugkeer.

(*c*) OPVOEDKUNDIGE EN WETENSKAPLIKE WERK.

Geen opvoedkundige werk word in hierdie Nasionale Park gedoen nie en dit skyn asof daar nog geen wetenskaplike verhandelings oor die fauna en die flora gepubliseer is nie.

2. DIE NASIONALE BONTEBOKPARK.

Net soos in die geval van die Addoolifantepark, is die Nasionale Bontebokpark gestig vir die bewaring van 'n enkele soort wilde dier, in hierdie geval die bontbok (*Damaliscus pygargus*).

Die Nasionale Bontebokpark is op 3 Julie 1931 op die plaas Quarrie Bos gestig wat 'n gedeelte van die plaas Bushy Park is en geleë in die Strandveld, 17 myl suid van Bredasdorp. Die oppervlakte van hierdie Park is 1,784·4 *acres* en toe dit gestig is, was daar 22 bontbokke op die plaas. Onder beskerming het die wildbokke in so'n mate aangewas dat die Raad maatreëls moes tref om te verhoed, dat daar te veel wild in die klein gebied saamgetrek word. Met tussenpose, gewoonlik elke twee jaar, word oortollige bokke gevang en aan belangstellende boere uitgedeel. Op hierdie wyse is die nuclei van verskillende nuwe troppe alreeds geskep sedert die eerste bontbokke in die jaar 1940 gevang is. As hierdie prosedure beperk word tot plekke waar die bontbok oorspronklik voorgekom het, kan die Raad se optrede ten sterkste aanbeveel word uit die soölogiese aspek. Daar is die addisionele voordeel dat, indien die nasionale trop deur 'n diere-epidemie sou uitgewis word, die dier nie met een slag sal uitsterf nie.

Dat die bontbok van algehele uitsterwing gered is, is te wyte aan die bestendige wyse waarop boere uit die Bredasdorpse distrik, veral die gesinne Van der Byl, Albertyn en Van Breda, hierdie wildbokke gedurende die negentiende en die huidige eeu bewaar het.

Die aantal bontbokke in die Nasionale Park word op ongeveer 100 gehou. Weens die betreklike klein gebied en die aard van die veld, is dit nie wenslik om 'n groter trop te hê nie.

Alhoewel die bontbok die eerste oorweging by die stigting van die Nasionale Bontebokpark in die jaar 1931 was, is dit verblydend om op te merk dat die vaalribbok (*Pelea capreolus*) ook in hierdie Park aard.

(*a*) SEISOEN.

'n Kleurling-veldwagter woon in die Nasionale Bontebokpark. Op weeksdae kan permitte om die Park binne te gaan, verkry word van die Magistraat te Bredasdorp en gedurende naweke van die Polisiestasie in dieselfde dorp. 'n Pad is in die Park aangelê sodat toeriste geen moeilikheid ondervind om die bokke te sien nie.

Die Nasionale Bontebokpark is binne maklike bereik met 'n motorkar van Bredasdorp af wat per spoor met Kaapstad verbind is.

Die toeriste-seisoen strek van 1 Desember tot 30 April.

(*b*) PUBLIEKE ONDERSTEUNING.

Die Nasionale Bontebokpark is die kleinste van die Unie se nasionale parke. Aangesien die diere gesien kan word gedurende die loop van 'n motorrit deur die Park, is geen spesiale huisvesting vir besoekers nodig nie.

Gedurende die jaar 1939, het 250 toeriste die Park besoek. In 1946 was die getal 378. Daar word gemeen dat die aantal nou sal toeneem.

(*c*) OPVOEDKUNDIGE EN WETENSKAPLIKE WERK.

Tot op datum is geen wetenskaplike of opvoedkundige werk in hierdie nasionale park gedoen nie.

3. DIE NASIONALE KALAHARI-GEMSBOKPARK.

Die Nasionale Kalahari-Gemsbokpark is die opvolger van die Gordonia-Kuruman-wildreserwe wat deur die Goewerment van die Kolonie van die Kaap die Goeie Hoop op 16 Oktober 1908 (Proklamasie No. 473, 1908) gestig is. Die Nasionale Kalahari-Gemsbokpark het op 3 Julie 1931 ontstaan.

Hierdie nasionale park is geleë in die hoek tussen die Nosob- en die Auobrivier in die droë noordweste

Bontbokke (Damaliscus pygargus) *in die Nasionale Bontebokpark.*

(Foto deur Dick Wolff.)

Rooihartbeeste (Alcelaphus caama) *in die Nasionale Kalahari-Gemsbokpark.*
(Foto deur Dick Wolff.)

van Suid-Afrika en is nie vir toeriste oop nie weens die onbereikbaarheid daarvan. Dit sal 'n dure onderneming wees om 'n goeie pad na die Nasionale Kalahari-Gemsbokpark aan te lê weens die sanderige geaardheid van die gebied ten noorde van Upington. Die oppervlakte van hierdie park is 2,392,521·4 *acres*.

Die gemsbok (*Oryx gazella*), die springbok (*A. marsupialis*), die blouwildebees (*G. taurinus*) en die rooihartbees (*A. caama*) is volop in die Nasionale Gemsbokpark. Die eland (*T. oryx*), die koedoe (*Strepsiceros strepsiceros*), die voltruis (*S. australis*) en vleestende diere soos die luiperd (*Panthera pardus*), die jagluiperd (*Acinonyx jubatus*), die wildehond (*Lycaon pictus*) en ander wild kom ook voor. Dit lyk egter of daar min leeus in hierdie nasionale park is.

Wanneer die tsamas (*Citrullus vulgaris*) ryp word, vorm hulle 'n belangrike voedsel- en waterbron vir wildbokke en ander diere in hierdie park.

4. DIE NASIONALE BERGSEBRAPARK.

Die Nasionale Bergsebrapark is op 2 Julie 1937 gestig (Proklamasie No. 112, 1937), op die plaas Babylonstoren in die Afdeling van Cradock met 'n oppervlakte van 1,675 morge 559 vierkante roede (3,547·1 *acres*). Hierdie nasionale park is die jongste van die vyf nasionale parke wat totnogtoe in die Unie ingevolge Wet No. 56 van 1926 gestig is.

Toe die Nasionale Bergsebrapark gestig is, was daar ses Kaapse bergsebras in die park maar net een was 'n merrie. Teen die einde van 1946 het hierdie getal gedaal tot drie, nl. twee hingste en een merrie. Daar die enigste oorblywende merrie teen die einde van 1947 gesterf het, het die status van die Kaapse bergsebra 'n kritiese fase bereik in die einste park wat vir sy bewaring gestig is. Dit is duidelik dat tensy die nucleus van twee Kaapse bergsebra-hingste aangevul kan word deur die invoering van merries van 'n ander plek af, die poging om hierdie haas uitgestorwe dier in die Nasionale Bergsebrapark te bewaar, tot mislukking gedoem is.

Die ongelukkige ondervinding met die Kaapse bergsebra in die Nasionale Bergsebrapark lê klem op die behoefte aan wetenskaplike leiding in die bewaring van skaars soorte.

Onlangs het Professor R. H. Compton, Direkteur van die Nasionale Botaniese Tuin, voorgestel dat enige nuwe maatreëls om die Kaapse bergsebra te bewaar, verbind moet word met die groter vraagstuk van die skepping van die hele gebied tussen die Robinson- en die Montagu-pas langs die Attaquas- en die Outeniqua-berge, tot 'n nasionale park.(4) So'n nasionale park sal nie slegs 'n toevlugsoord vir die bergsebra en ander wild van daardie bergagtige streek bied nie, maar dit sal ook 'n natuurskone park wees en 'n beskermingsplek vir die plantegroei wat tipies is van daardie gedeelte van die Kaapprovinsie.

Die Bergsebrapark is nie vir toeriste oop nie.

Elf Kaapse bergsebras, 'n geskenk van mnr. H. J. Lombard van die plaas Waterval by Cradock, is op 9 November 1950 oorgejaag na die Nasionale Bergsebrapark.

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II—NATUURTUINE

Op die oomblik bestaan die volgende Natuurtuine in die Provinsie van die Kaap die Goeie Hoop: —

AFDELINGSRADE SE NATUURTUINE.

Naam.	Oppervlakte.	Datum van Stigting.
	Acres.	
1. Natuurtuin Kaap die Goeie Hoop (Afdeling van die Kaap)	Ongeveer 16,297 toe dit gestig was. Tans 16,841	1 Februarie 1946.
2. Plaaslike gebied van die Nortier Reserwe van Otterdam (Afdeling van Clanwilliam)	Ongeveer 6,350	3 Mei 1935.
3. Natuurtuin Robbeberg (Afdeling van Knysna).........	Ongeveer 433	17 September 1948. (Kennisgewing No. V. 140.)

1. NATUURTUIN KAAP DIE GOEIE HOOP.

Ingevolge Ordonnansie No. 18 van 1939 van die Provinsie van die Kaap die Goeie Hoop word plaaslike besture gemagtig om Natuurtuine te verkry, te stig en te onderhou „ vir die voortplanting, beskerming en behoud daarin van wilde dierelewe, wilde plantegroei en voorwerpe van geologiese, etnologiese, historiese of ander wetenskaplike belang, in die belang en tot voordeel en genot van die publiek oor die algemeen. "

Op 1 Desember 1939 is die bepalings van Ordonnansie No. 18 van 1939 van toepassing gemaak op die Afdelingsraad van die Kaap en daardie Raad het die grense van die Natuurtuin Kaap die Goeie Hoop op 1 Februarie 1946 bepaal deur publikasie in die *Offisiële Koerant* van die Provinsie van die Kaap die Goeie Hoop.

Die Natuurtuin Kaap die Goeie Hoop sluit in die suidelikste gedeelte van die Kaapse Skiereiland en is dus geleë in die oudste bewoonde gedeelte van die Unie van Suid-Afrika.

Die vaalribbok (*P. capreolus*), grysbok (*Nototragus melanotis*), steenbok (*R. campestris*), grysduiker (*S. grimmia*) en baie soorte wilde voëls sowel as skaars blomme soos die blou disa (*Herschelia graminifolia*) en die mielieheide (*Erica Patersonia*) word in die Tuin gevind. Elande (*T. oryx*) en bontbokke (*D. pygargus*) is sedert die stigting daarvan in die Natuurtuin Kaap die Goeie Hoop ingevoer.

'n Adviserende Raad, bestaande uit twaalf lede, is deur die Afdelingsraad van die Kaap benoem „ om hom van advies te dien en aanbevelings te doen betreffende die beheer, bestuur en algemene welsyn van die natuurtuin."

Op 23 Mei 1946 het hierdie Tuin ook 'n Veldblomreserwe (Proklamasie No. 69, 1946) geword.

2. PLAASLIKE GEBIED VAN DIE NORTIER RESERWE VAN OTTERDAM.

Hierdie reserwe is deur die Administrateur van die Provinsie van die Kaap die Goeie Hoop gestig deur

Proklamasie No. 68 van 1935 en terselfdertyd is al die bevoegdhede van Ordonnansie No. 13 van 1917, wat betrekking het op Plaaslike Gebiede, aan die Afdelingsraad van Clanwilliam oorgedra.

Die Nortier Reserwe van Otterdam is ingekamp en beslaan 'n gebied van ongeveer 6,350 *acres*. Dit bevat steenbokke (*R. campestris*), grysduikers (*S. grimmia*) en talle volstruise (*S. australis*.) In Mei van die jaar 1946 is 'n aantal bontbokke (*D. pygargus*) in die reserwe losgelaat.

3. NATUURTUIN ROBBEBERG.

Deur Kroongrondbrief No. 50 van 1943 is die skeireiland bekend as Robbeberg in Plettenbergbaai aan die Afdelingsraad van Knysna oorgedra. Op 'n oppervlakte van ongeveer 433 *acres* het die Afdelingsraad van Knysna die Natuurtuin Robbeberg gestig. Die grense van hierdie nuwe natuurtuin is op 17 September 1948 (V. 140) bepaal en voorsiening is gemaak vir 'n Adviserende Raad van agt lede (Kaapse Provinsiale Administrasie Kennisgewing No. 327 van 1945).

ORANJE-VRYSTAAT

I—NASIONALE PARKE

OP die oomblik is daar geen nasionale park in hierdie provinsie van die Unie van Suid-Afrika nie.

II—WILDRESERWES

Die volgende Wildreserwes bestaan in die Oranje-Vrystaat:—

(*a*) PROVINSIALE WILDRESERWES.

Naam.	Oppervlakte.	Datum van Stigting.
	Acres.	
1. Vrystaatse Wildtuin (Distrik Winburg)...............	24,262·6	9 Oktober 1925 (Oranje-Vrystaat Ord. No. 8 van 1925).
2. Vaal-Hartz Wildreserwe. (Distrik Heilbron)...........	Ongeveer 185,829·0	24 Maart 1939.

(*b*) MUNISIPALE WILDRESERWES.

Naam.	Oppervlakte.	Datum van Stigting.
	Acres.	
1. Franklin Wildreserwe (Bloemfontein)................	Ongeveer 468	29 April 1929.
2. Mynhardt Wildreserwe (Bethulie).....................	265	1933.

(*a*) PROVINSIALE WILDRESERWES.

1. VRYSTAATSE WILDTUIN.

Hierdie wildreserwe is geleë in die distrik Winburg, ongeveer dertig myl van die dorp Theunissen. Die gebied beslaan 24,262·6 *acres*.

Alhoewel die Ordonnansie wat oor die stigting van hierdie reserwe gaan, die „Somerville Wild Reserwe Ordonnansie 1925" heet, het die Provinsiale Raad van die Oranje-Vrystaat besluit om die naam „Vrystaatse Wildtuin" aan die reserwe self te gee.

Die grootste gedeelte van die reserwe bestaan uit die plaas Somerville No. 1664, maar 'n oppervlakte van 4,465·5 *acres* van die aangrensende plaas Doornpan word ook deur die Provinsiale Administrasie van die Oranje-Vrystaat vir die bewaring van wild gebruik.

Die vernaamste soorte wild wat in die Vrystaatse Wildtuin aangetref word, is blesbokke (*D. albifrons*) en springbokke (*A. marsupialis*) van elk waarvan daar verskeie duisende is.

'n Vangkraal is in die reserwe opgerig. Van tyd tot tyd word klopjagte op wild gedurende die wintermaande gehou, met die oog daarop om blesbokke en springbokke te vang en om hulle teen redelike pryse aan wetenskaplike inrigtings en aan boere te voorsien wat weer wild op hulle plase wil aanhou of wat hulle troppe wil aanvul.

Voor die jaar 1936 was daar nêrens in die Unie swartwildebeeste (*C. gnou*) op Kroongrond nie. Dit was hoofsaaklik op herhaalde vertoë deur die Wildbeskermingsvereniging van Suid-Afrika dat die Provinsiale Administrasie van die Oranje-Vrystaat vyf koeie in die Vrystaatse Wildtuin in Oktober van die jaar 1936 vrygelaat het. In Maart 1937 is 'n bul bygevoeg en in April van die jaar 1939 is nog 'n bul en ses koeie ingevoer in die Reserwe.(²) Op 29 September 1947 is 51 volgroeide swartwildebeeste met welslae oorgeplaas na die Vrystaatse Wildtuin van 'n plaas af in die besit van dr. G. A. Beyers en in die distrik Kroonstad geleë. 'n Sensus is in Desember van die jaar 1947 gehou toe daar geblyk het dat daar 120 swartwildebeeste in die Vrystaatse Wildtuin is.

Op 9 Oktober 1940 is twee rooihartbeesbulle (*A. caama*) en drie koeie van die De Beers Consolidated Mines, Ltd., in Kimberley verkry en in die Doornpan-afdeling vrygelaat. In Desember van die jaar 1947 was daar sestien rooihartbeeste in die reserwe. Die bedoeling is om nog meer van hierdie diere te kry om in die reserwe vry te laat.

Stappe is ook deur die Provinsiale Administrasie van die Oranje-Vrystaat gedoen om elande (*T. oryx*) in die Vrystaatse Wildtuin in te voer. Op 25 November 1943 is drie elandkalfies (een bulletjie en twee versies) van die Provinsiale Administrasie van Natal verkry en aan die bottel grootgemaak totdat hulle ongeveer 'n jaar oud was. Hulle is toe in die Doornpan-afdeling vrygelaat en op 10 Desember 1947 is sewe elande daar getel.

Behalwe rooihartbeeste en elande is daar ook sebras (soort?) in die Doornpan-afdeling van die Vrystaatse Wildtuin.

Daar bestaan geen fasiliteite vir toeriste in die Vrystaatse Wildtuin nie en daar word ook geen wetenskaplike of opvoedkundige werk gedoen nie.

2. Vaal-Hartz Wildreserwe.

Hierdie wildreserwe beslaan 'n oppervlakte van ongeveer 185,829 *acres*. Dit vorm 'n deel van die Vaalbank Dam Uitbreidingskema en is aan die Oranje-Vrystaatse kant gestig, dit is die suidelike sy van die Vaalrivier, om ooreen te stem met die Vaal-Hartz Wildreserwe aan die Transvaalse kant, dit is die noordelike sy van die Vaalrivier.

Daar word geen spesiale fasiliteite vir toeriste voorsien nie en daar word ook geen opvoedkundige of wetenskaplike werk in hierdie reserwe gedoen nie.

(*b*) MUNISIPALE WILDRESERWES.

1. Franklin Wildreserwe.

Die Franklin Wildreserwe is een van twee munisipale wildreserwes in die Oranje-Vrystaat. Dit is gestig op 29 April 1929, toe die Stadsraad van Bloemfontein besluit het om dit die Franklin Wildreserwe te noem ter ere van Raadslid J. Stuart Franklin, die stigter van die skema. Die Stadsraad het in die jaar 1928 besluit om hierdie reserwe te stig. Dit sluit die sogenaamde Naval Hill-gebied binne die stad van Bloemfontein in.

Daar dien vermeld te word dat die Franklin Wildreserwe verskil van die munisipale wildreserwes van Transvaal deurdat dit nie tot 'n wildreserwe geproklameer is ingevolge die Oranje-Vrystaatse Provinsiale Wildordonnansie nie. Daar hierdie reserwe sekere wildbokke bevat wat nie inheemse bokke in hierdie gebied is nie, is dit miskien beter om dit 'n munisipale wildpark te noem.

Die Franklin Wildreserwe beslaan 'n oppervlakte van ongeveer 468 *acres*. Op die oomblik bevat dit springbokke (*A. marsupialis*), blesbokke (*D. albifrons*), geelwaterbokke (*Onotragus leche*), sebras (*Hippotigris burchellii chapmani*?), elande (*T. oryx*), steenbokke (*R. campestris*), vaalribbokke (*P. capreolus*) en grysduikers (*S. grimmia*). Al hierdie soorte is ingevoer toe die reserwe gestig is.

Die Franklin Wildreserwe is heeltemal ingekamp en motorpaaie is aangelê. Daar is slegs een ingangs- en een uitgangspunt en dit is voorsien van motorhekke.

Die reserwe is dwarsdeur die jaar oop maar geen opvoedkundige of wetenskaplike werk word gedoen nie.

Ten tyde van sy stigting is die

Franklin Wildreserwe deur die Kurator van die Bloemfonteinse Dieretuin beheer, maar dit word tans deur die Parke-departement van die Stad van Bloemfontein geadministreer.

Dit is interessant om daarop te let dat die E. Lamont-Hussey-sterrewag van die Universiteit van Michigan op Naval Hill binne die Franklin Wildreserwe gebou is.

2. Mynhardt Wildreserwe.

Net soos die Franklin Wildreserwe in Bloemfontein, is die Mynhardt Wildreserwe nie ingevolge die Wildordonnansie van die Oranje-Vrystaat geproklameer nie. Hierdie reserwe heet na sy stigter, dr. J. T. Mynhardt.

Die Mynhardt Wildreserwe is 'n ingekampte gebied aan die buitewyke van die dorp Bethulie in die suidelike Oranje-Vrystaat. Dit is in die jaar 1933 deur die Stadsraad van Bethulie gestig en beslaan 'n oppervlakte van 265 *acres*. Al die diere in die reserwe is op verskeie tye ingevoer en aangesien daar soorte is wat nie inheems in hierdie gebied is nie, is dit verkieslik om dit as 'n munisipale wildpark te beskou.

NATAL

◆◆

NASIONALE PARKE, WILDRESERWES EN NATUURTUINE

ALGEMEEN.

MET ingang van 1 Desember 1947 is alle bestaande nasionale parke, wildreserwes en natuurtuine in Natal oorgeneem deur die Raad vir die Bewaring van Natalse Parke, Wild en Vis (Ordonnansie op die Bewaring van Natalse Parke, Wild en Vis, No. 35 van 1947).

(*a*) OMVANG VAN BESKERMING.

Die omvang van beskerming van alle nasionale parke, wildreserwes en natuurtuine wat deur die Raad vir die Bewaring van Natalse Parke, Wild en Vis geadministreer word, is net so omvattend as dié wat neergelê is in die geval van nasionale parke gestig ingevolge Wet No. 56 van 1926. Ingevolge artikel 12 van die Ordonnansie op die Bewaring van Natalse Parke, Wild en Vis, No. 35 van 1947, is die Raad vir die Bewaring van Natalse Parke, Wild en Vis gemagtig „om alle parke, wildtuine en natuurtuine te beheer, bestuur en in stand te hou vir die voortplanting, beskerming en behoud daarin van alle wilde diere, wilde plantegroei en voorwerpe van geologiese, etnologiese, geskiedkundige of ander wetenskaplike belang. ”

Alhoewel die woordomskrywing van „dier ” en „vis ” meer bevredigend is in die Natalse Ordonnansie, No. 35 van 1947, as in die Wet op Nasionale Parke, No. 56 van 1926, dien daarop gelet te word dat die Natalse Ordonnansie nie voorsiening maak vir die beskerming van *Amphibia* en verskillende groepe ongewerwelde diere nie.

Op die oomblik word daar geen georganiseerde opvoedkundige of wetenskaplike werk in enige nasionale park, wildreserwe of natuurtuin in Natal gedoen nie. Maar met ingang van 1 Desember 1947 het die Administrateur van Natal 'n navorsingskomitee van vier lede benoem ingevolge die bepalings van die Ordonnansie op die Bewaring van Natalse Parke, Wild en Vis, No. 35 van 1947.

(*b*) ONDERHOUD.

In artikel 13 van die Ordonnansie op die Bewaring van Natalse Parke, Wild en Vis, word bepaal dat die inkomste van die Raad bestaan uit „(1) vrywillige subskripsies, donasies en skenkings deur hom ontvang, (2) gelde deur hom ingevolge die bepalings van hierdie deel van die Ordonnansie ontvang of gehef, (3) boetes ontvang of ingevorder ten opsigte van oortredings van hierdie deel van die Ordonnansie of die regulasies daarkragtens uitgevaardig, en (4) jaarlikse subsidies uit gelde deur die Provinsiale Raad vir die doel toegewys. ”

I—NASIONALE PARKE

Op die oomblik is daar twee nasionale parke in Natal, nl., die Natalse Nasionale Park, tans bekend as die Koninklike Natalse Nasionale Park en die Wildtuin Giant's Castle.

1. DIE KONINKLIKE NATALSE NASIONALE PARK.

Hierdie Park is op 19 September 1916 gestig met 'n oppervlakte van ongeveer 8,120 *acres*. Op daardie datum het die Uitvoerende Komitee van die Natalse Provinsiale Raad ingestem om sekere plase en Kroongrond oor te neem en te administreer wat deur die Departement van Lande vir die doel van 'n nasionale park afgesonder is. Maar die formele proklamasie van die Koninklike Natalse

Nasionale Park het nie voor 6 Mei 1943 (Proklamasie No. 20, 1943) plaasgevind nie. Sedert die stigting van hierdie nasionale park in 1916 is sy oppervlakte vergroot met die gevolg dat dit tans ongeveer 20,000 *acres* beslaan.

Die Koninklike Natalse Nasionale Park is hoofsaaklik 'n natuurskone park wat vergelyk kan word met sommige van die nasionale parke van die Verenigde State. Dit is op die Drakensberge geleë in die magistraatsdistrik van Bergville en is ongeveer 30 myl van die dorpie Bergville af. Mont-aux-Sources, met 'n hoogte van ongeveer 11,000 voet is een van die hoogste bergpunte in die Unie van Suid-Afrika en is in hierdie Park geleë. Die bergpunt se naam het betrekking op die feit dat drie riviere hulle oorsprong naby mekaar in hierdie gebied het, nl., die Tugela-, die Elands- en die Oranjerivier.

(*a*) SEISOEN.

Die Koninklike Natalse Nasionale Park is dwarsdeur die jaar oop.

(*b*) HUISVESTING EN TOERISTE.

'n Koshuis wat aan die voet van die Tugelarivier se waterskeiding gebou is, bied huisvesting vir ongeveer 100 persone, meeste daarvan in die vorm van rondawels met klip gebou met grasdakke. Waterriolering, warm en koue water en elektriese lig is aangebring.

'n Kampeerterrein is uitgelê vir diegene wat graag in hulle eie tente wil uitkamp.

Die vernaamste ontspanning in hierdie Nasionale Park is bergklim, hengel, swem, ry en tennisspeel.

(*c*) BEREIKBAARHEID.

Die Koninklike Natalse Nasionale Park kan maklik met die pad bereik word. Dit lê ongeveer 30 myl ten weste van die dorpie Bergville wat op die spoorweglyn van Estcourt af is. Spoorwegbusse loop driemaal per week van Ladysmith oor Bergville na die Park.

2. WILDTUIN GIANT'S CASTLE.

So lank gelede as 27 Oktober 1903 het die Natalse Regering alreeds sy voorneme bekendgemaak om 'n wildreserwe op die Kroongrond in die omgewing van Giant's Castle te stig (Goewermentskennisgewing No. 735 van 1903). Die laasgenoemde kennisgewing het in werklikheid die aanstelling van mnr. Sydney Barnes, as „ Ranger of the Game Reserve " aangekondig, maar aangesien die gebied nie behoorlik omskryf is nie voor 18 Junie 1907 (Goewermentskennisgewing No. 356 van 1907), kan hierdie datum as die stigtingsdatum van die Giant's Castle Wildreserwe aangeneem word. Op 6 Mei 1943 is hierdie reserwe se status verhef tot dié van 'n nasionale park by Proklamasie No. 20 van 1943 (sien ook Proklamasie No. 93 van 1949, afgekondig op 20 Oktober 1949).

Die Wildtuin Giant's Castle is geleë aan die oostelike hange van die Drakensberg ongeveer 40 myl van Estcourt af en beslaan 'n oppervlakte van ongeveer 50,000 *acres*. Dit is hoofsaaklik gestig met die doel om die oorblywende elande (*T. oryx*) in Natal te bewaar, maar daar is ook ander soorte wildbokke in hierdie reserwe, soos die bosbok (*T. scriptus*), die rietbok (*Redunca arundinum*), die rooiribbok (*R. fulvorufula*), die vaalribbok (*P. capreolus*), die oorbietjie (*O. ourebi*), die steenbok (*R. campestris*), die grysduiker (*S. grimmia*) en die klipspringer (*Oreotragus oreotragus*).

In Februarie van die jaar 1949 is eenduisend sewehonderd stuks elande in hierdie nasionale park en op aangrensende Kroongrond, plase en bosreserwes getel (sien Eerste Verslag van die Raad vir die Bewaring van Natalse Parke, Wild en Vis van 1 Desember 1947 tot 31 Maart 1949).

(*a*) HUISVESTING.

'n Paar rushutte is gebou op 'n kampeerterrein wat daarvoor afgesonder is. Verdere ontwikkelings word in die vooruitsig gestel. Toeriste moet hulle eie proviand saambring en, alhoewel die wildtuin dwarsdeur die jaar oop is, moet besoekers in verbinding tree met die Konservator van Wild te Rockmount voordat hulle 'n reis na die wildtuin onderneem.

(*b*) HENGEL.

'n Spesiale aantrekkingskrag van die Wildtuin Giant's Castle is die feit dat daar vooruitsigte is om forelle te vang in die Boesmansrivier wat deur die wildtuin vloei.

(*c*) BOESMANTEKENINGE.

Daar is uitstekende voorbeelde van Boesmantekeninge in die Wildtuin Giant's Castle.

II—WILDRESERWES

In Natal dagteken die eerste wildreserwe meer as vyftig jaar terug toe vier in Zoeloeland gestig is by Goewermentskennisgewing (Zululand) No. 16 van 1897, van 22 April 1897 en afgekondig op 27 April 1897. Twee van hierdie, naamlik die Hluhluwe Wildreserwe en die Umfolosi Wildreserwe bestaan nog.

Die volgende Wildreserwes bestaan in Natal:—

(*a*) PROVINSIALE WILDRESERWES.

Naam.	Oppervlakte.	Datum van Stigting.
	Acres.	
1. Hluhluwe Wildreserwe (Distrik Hlabisa)..............	Ongeveer 40,000	27 April 1897 (sien ook Proklamasie No. 35 van 1939).
2. Umfolosi Wildreserwe (Distrikte van Laer Umfolosi en Mahlabatini)	Ongeveer 72,000	27 April 1897.
3. Mkuzi Wildreserwe (Distrik Ubombo)................	Ongeveer 62,000	15 Februarie 1912.
4. Ndumu Wildreserwe (Distrik Ingwavuma)............	Ongeveer 25,000	17 April 1924 (sien ook Proklamasie No. 13 van 1947).
5. St. Lucia Wildtuin (Distrik Hlabisa)..................	Ongeveer 91,090	21 Maart 1935 (sien ook Proklamasie No. 35 van 1939).
6. Richardsbaai Wildtuin (Distrik van Laer Umfolosi)....	Ongeveer 2,000	5 September 1935.
7. *Sordwanabaai Wildreserwe (Distrik Ubombo)........	Ongeveer 1,000	Nog nie geproklameer nie.

*Intussen is hierdie reserwe onder die naam „Nasionale Park Sordwanabaai" tot 'n nasionale park verklaar (Prok No. 72 van 1950, 1 Desember 1950).

1. HLUHLUWE WILDRESERWE.

Die Hluhluwe Wildreserwe lê in die bergagtige gebied van oos-Zoeloeland langs die Hluhluwe- en die Enzamanerivier. Dit beslaan ongeveer 40,000 *acres* wat diselfde is as toe dit oorspronklik gestig is in die jaar 1897. Indien die ingekampte gebied van die „korridor" ingesluit word, is die gebied van die Hluhluwe Wildreserwe tans ongeveer 57,000 *acres* groot.

Hierdie wildreserwe is die hoofkwartier van die swartrenoster (*D. bicornis*) in Zoeloeland waarvan daar ongeveer 160 (1949) was. Daar is ook nege witrenosters (*C. simum simum*) in die Hluhluwe Wildreserwe (1949).

(*a*) ADMINISTRASIE.

Soos alreeds aangedui, word die Hhluhluwe Wildreserwe deur die Raad vir die Bewaring van Natalse Parke, Wild en Vis geadministreer.

(*b*) SEISOEN.

Daar is geen besondere seisoen vir hierdie wildreserwe nie. Toeriste kan dit dwarsdeur die jaar besoek, maar aangesien die gemiddelde reënval vyftig duim per jaar is, is daar 'n

Folosi (die enigste Zoeloelandse Witrenosterbul in gevangenskap) is gevang in Natal (Umfolosi Wildreserwe) en vervoer na die Pretoriase Dieretuin deur die Transvaalse Provinsiale Administrasie.

(Foto deur Martin Gibbs.)

weelderige struikegroei gedurende die somermaande; dit maak dit moeilik om wild gedurende daardie maande raak te sien. Uit 'n natuurskoonheidsoogpunt is die Hluhluwe Wildreserwe op sy beste gedurende die somer.

Die aanwesigheid van leeus in die Nasionale Kruger-wildtuin maak dit noodsaaklik dat daar 'n regulasie is om toeriste te verbied om hulle motorkarre te verlaat terwyl hulle op die paaie is. In die Hhluhluwe Wildreserwe is daar geen leeus nie en dus word toeriste nòg verbied om die paaie nòg om hulle motorkarre te verlaat. Diegene wat dit verlang, kan die diens van naturelle-wildwagters verkry teen 'n redelike koste en kan na hartelus deur die reserwe ronddwaal langs spesiale voetpaaie.

(*c*) HUISVESTING VIR TOERISTE.

Daar is slegs een ruskamp in die Hhluhluwe Wildreserwe met huisvesting vir ongeveer 70 toeriste. Hierdie ruskamp is op 'n hoogte van ongeveer 1,500 voet bo seespieël geleë en die hutte is meesal die rondaweltipe met grasdakke. Hulle is gerieflik gemeubileer en beddegoed, breekgoed, tafelgereedskap, kombuisgereedskap en elektriese lig word voorsien. Petrol is in die ruskamp verkrygbaar maar die toeriste moet hulle eie voedsel saambring.

(*d*) PUBLIEKE ONDERSTEUNING.

Gedurende die jaar wat op 31 Maart 1947 geëindig het, het meer as 1,400 persone hierdie reserwe besoek. Vir die jaar wat op 31 Maart 1940 geëindig het, was die aantal ongeveer 2,500.

(*e*) BEREIKBAARHEID.

Die Hluhluwe Wildreserwe kan per pad van Mtubatuba in die suide en Nongoma en ander plekke in die noorde bereik word. Toeriste kan ook per trein van Durban af tot by Mtubatuba of Hluhluwe kom en daarvandaan per motorkar tot by die reserwe.

(*f*) TOEKOMSTIGE ONTWIKKELING.

Dit is die voorneme om die Hluhluwe Wildreserwe met die Umfolosi Wildreserwe te verbind deur die inlywing van die sogenaamde „korridor" aan die suidweste kant van die Hluhluwe Wildreserwe. Vir hierdie doel sal die huidige Umfolosi Wildreserwe in grootte verminder word tot 'n strook wat ten suide van die Swart Umfolosi-rivier geleë is.

Met die doel om die Hluhluwe Wildreserwe te vergroot, is 'n begin in die jaar 1940 gemaak met die inkamping van die gebied. Teen Maart 1947 is die hele Hluhluwe Wildreserwe en die grootste gedeelte van die korridor reeds ingekamp. Die draadheining bestaan uit vyf of ses doringdrade met hangertjies en houtpale. Laasgenoemde word afgewit en verskillende rye sisalhennep is aan die binnekant van die draad geplant. Los stukke yster word aan die boonste draad vasgemaak en hulle skrik alle diere af wat per toeval met die draad in aanraking kom (Tweede Verslag van die Zoeloeland-wildreserwes en Parkeraad vir die jaar wat op 31 Maart 1941 geëindig het). Dit blyk dat hierdie soort draadheining 'n sukses is en dit kos minder as tien sjielings per myl per jaar om dit te onderhou.

2. UMFOLOSI WILDRESERWE.

Die Umfolosi Wildreserwe lê in die hoek tussen die Swart- en die Wit-Umfolosirivier en is die hoofkwartier van die Zoeloelandse witrenoster (*Ceratotherium simum simum*) in Zoeloeland. 'n Onlangse offisiële sensus is nie beskikbaar nie, maar die mening bestaan dat daar tans ongeveer 500 witrenosters in hierdie reserwe is.

Die oppervlakte van die Umfolosi Wildreserwe is dieselfde as wat dit was toe dit op 27 April 1897 gestig is, dit wil sê ongeveer 72,000 *acres*.

Daar bestaan geen fasiliteite vir toeriste in die Umfolosi Wildreserwe nie. Die Nagana-navorsingstasie is te Masimba aan die oostelike oewer van die Swart-Umfolosirivier geleë naby sy samevloeiing met die Wit-Umfolosirivier.

Dit is onwaarskynlik dat die Umfolosi Wildreserwe vir die publiek oopgestel sal word voor 'n hele tyd na die veldtog teen die Zoeloelandse tsetsevlieg (*Glossina pallidipes*) afgesluit is. Alle persone wat in die bewaring van wild in Suid-Afrika belangstel, hoop dat die maatreëls wat tans in Zoeloeland geneem word, die nagana-vraagstuk vir altyd sal oplos.

3. MKUZI WILDRESERWE.

Die Mkuzi Wildreserwe het 'n oppervlakte van ongeveer 62,000 *acres* en lê 'n paar myl suidoos van die dorpie Ubombo in Zoeloeland. Sy noordelike grens is 'n deel van die Mkuzirivier en sy suidelike grens 'n deel van die Umsunduzirivier. Daar is 'n paar leeus in hierdie reserwe wat die laaste van hulle soort in Zoeloeland is.

Weens die anti-nagana-veldtog wat tans in Zoeloeland gevoer word, is die Mkuzi Wildreserwe nie vir besoekers oop nie. Dit is in hierdie reserwe wat daar vir die eerste maal 'n poging aangewend is om D.D.T. op 'n groot skaal uit vliegtuie te bestuif teen die tsetsevlieg.

4. NDUMU WILDRESERWE.

Die Ndumu Wildreserwe is ongeveer 25,000 *acres* groot en is in die uiterste noordpunt van Zoeloeland langs die grens van Portugees-Oos-Afrika geleë. Sy noordelike grens is die Usuturivier en die Pongolarivier vloei noordwaarts deur die reserwe.

(*a*) Huisvesting.

Geen huisvesting is op die oomblik in die Ndumu Reserwe beskikbaar nie. nie. Toeriste moet dus bereid wees om uit te kamp en al hulle benodigdhede saam te bring. Daar is 'n winkel by Ndumu, drie myl van die reserwe af. Dit is belangrik dat uitkampers voorsorgsmaatreëls teen malaria tref; die veiligste maande van die jaar om uit te kamp, is van Julie tot Desember.

(*b*) Bereikbaarheid.

Die Ndumu Wildreserwe kan met die pad bereik word van Stegi in Swaziland, 'n afstand van ongeveer 30 myl. Mkuzistasie is ongeveer 64 myl van die reserwe af en Gollelstasie ongeveer 40 myl.

(*c*) Hengel.

Hengel word in hierdie reserwe toegelaat waar kurpers (*Tilapia* spp.) en tiervis (*Hydrocyon*) volop is.

5. ST. LUCIA WILDTUIN.

Die St. Lucia Wildtuin omvat die gebied wat met water oordek word tot op die hoogwatermerk en wat bekend is as Saint Lucia-meer, Valsbaai en die riviermond wat St. Luciameer met die Indiese Oseaan verbind, met inbegrip van St. Lucia-meer en alle eilande in hierdie gebied. St. Lucia-meer is 'n groot uitgestrekte stuk water ongeveer 45 myl lank en wat wissel van ongeveer een tot ongeveer 15 myl in breedte. Die oppervlakte van St. Lucia Wildtuin is ongeveer 91,090 *acres*.

Hierdie wildtuin is gestig hoofsaaklik om die oorvloed van voëls van daardie gebied te bewaar, maar dit bevat ook 'n aantal seekoeie (*H. amphibius*). Daar is ook talle Afrikaanse krokodille (*Crocodylus niloticus*) in die wildtuin.

Op 27 April 1897 is 'n reserwe, bekend as St. Lucia Reserwe No. 3, ingevolge Goewermentskennisgewing (Zoeloeland) No. 16 van 1897 gestig. Maar hierdie wildreserwe verskil van die huidige St. Lucia Wildtuin deurdat dit 'n gebied was wat net uit land bestaan het. Dit het 'n gedeelte ingesluit van wat bekend is as St. Lucia Park (sien Proklamasie No. 35 van 1939, *Offisiële Koerant van die Provinsie Natal*, 31 Augustus 1939).

(*a*) SEISOEN.

Die St. Lucia Wildtuin kan dwarsdeur die jaar besoek word, maar in die somer is voorsorgsmaatreëls teen malaria nodig indien die hele gebied besoek word.

(*b*) HUISVESTING.

Daar is verskillende hotelle naby die mond van die St. Lucia-baai en rushut-huisvesting is beskikbaar te Charter's Creek, 'n sentrale punt op die St. Lucia-meer. Kampeer word toegelaat maar nie gedurende die maande Januarie tot Mei nie. Die kampeerterrein is by die mond, Charter's Creek, Valsbaai en Picnic Point in Valsbaai. Daar is twee winkels by St. Lucia.

(*c*) BEREIKBAARHEID.

St. Lucia Wildtuin kan maklik per pad bereik word van Mtubatuba wat ongeveer 18 myl ver is.

(*d*) HENGEL.

Daar is volop seevis in beide St. Lucia-baai en sy monding asook in Valsbaai. Die wildtuin is dus vinnig besig om 'n baie populêre hengeloord te word.

6. RICHARDSBAAI WILDTUIN.

Die Richardsbaai Wildtuin omvat die gebied wat met water oordek word tot op die hoogwatermerk asook die Umhlatuzi-lagune en alle eilande binne die gebied. Die totale oppervlakte, met inbegrip van die oppervlakte van die water, is ongeveer 2,000 *acres*.

Die Richardsbaai Wildtuin is, net soos die St. Lucia Wildtuin, in die eerste instansie gestig om die voëls van daardie gedeelte van Zoeloeland te bewaar.

(*a*) SEISOEN.

Hierdie wildtuin is dwarsdeur die jaar oop, maar kampering word nie toegelaat gedurende die maande Januarie tot Mei nie. Kampeerders moet hulle eie benodigdhede voorsien en word aangeraai om voorsorgsmaatreëls teen malaria te tref.

(*b*) BEREIKBAARHEID.

Die Richardsbaai Wildtuin kan maklik per pad bereik word van Empangeni af wat ongeveer twaalf myl daarvandaan geleë is. Toeriste kan ook per spoor tot by Empangeni reis en daar motorkarre huur.

(*c*) HENGEL.

Hierdie wildtuin het nou 'n baie populêre hengeloord geword.

(*b*) NATUURTUINE.

Naam.	Oppervlakte.	Datum van Stigting.
	Acres.	
1. Natuurtuin Enseleni	Ongeveer 725	22 Januarie 1948.
2. Natuurtuin Umlalazi	Ongeveer 540 (nou ongeveer 2,240).	5 Februarie 1948.
3. Natuurtuin Coleford	Ongeveer 3,143	4 Maart 1948 (afgeskaf deur Prok. No. 15 van 1949 met ingang van 31 Maart 1949).
4. Natuurtuin Kosibaai	Ongeveer 50	19 Januarie 1950.

Natat hierdie manuskrip aan die drukker oorhandig is, is die volgende nuwe natuurtuin in Natal gestig: *Natuurtuin Oribi Gorge*, gestig op 1 April 1950 (Proklamasie No. 19 van 1950, gepubliseer in die *Offisiële Koerant van die Provinsie Natal*, 30 Maart 1950).

Intussen is die volgende Natuurtuine ook gestig:—

Natuurtuin Rugged Glen (1 Julie 1950), Natuurtuin Krantzkloof (7 September en 29 Desember 1950) en Natuurtuin Kamberg (1 Junie 1951).

7. SORDWANABAAI WILDRESERWE.

Daar bestaan voornemens om mettertyd hierdie reserwe te stig met 'n oppervlakte van ongeveer 1,000 *acres*. (Sien bl. 31.)

1. NATUURTUIN ENSELENI.

Hierdie natuurtuin is gestig deur Proklamasie No. 4 van 1948 (afgekondig op 22 Januarie 1948) op 'n stuk Kroongrond in Zoeloeland wat bekend is as die „ Beauty Spot ". Sy oppervlakte is ongeveer 725 *acres*.

2. NATUURTUIN UMLALAZI.

Die Natuurtuin Umlalazi, ongeveer 540 *acres* groot, is op 5 Februarie 1948 deur Proklamasie No. 13 van 1948 gestig. Dit is in die dorp Mtunzini in Zoeloeland geleë.

3. NATUURTUIN COLEFORD.

Die Natuurtuin Coleford is gestig deur Proklamasie No. 15 van 1948 op 4 Maart 1948. Sy oppervlakte is ongeveer 3,143 *acres*.

Weens regsmoeilikhede in verband met huurkontrakte en huurgelde is hierdie natuurtuin deur Proklamasie No. 15 van 1949 opgehef met ingang van 31 Maart 1949.

4. NATUURTUIN KOSIBAAI.

Hierdie natuurtuin is op 19 Januarie 1950 gestig op 'n stuk grond ongeveer 50 *acres* groot wat deur die Natalse Provinsiale Administrasie gehuur word. Dit is te Kosibaai geleë aan die noordelike end van die Nhlanga-meer in Reserwe No. 14, Distrik Ingwavuma in Zoeloeland (sien Tekening P.S. (R) No. N. 108, van 9 Oktober 1947).

(*c*) PRIVATE WILDRESERWES WILDTUINE).

Benewens die voornoemde provinsiale wildreserwes in Natal, is 'n aantal private wildreserwes gestig ingevolge artikel 17 van die Wild Ordonantie van 1912 (sien Provinsiale Kennisgewing No. 131, 1941, afgekondig op 17 April 1941 en Provinsiale Kennisgewing No. 148, 1941, afgekondig op 1 Mei 1941).

Private wildreserwes word deur die Administrateur van Natal gestig wanneer plaaseienaars skriftelike aansoek by hom indien. Die kennisgewings wat sodanige grond tot wildreserwes verklaar, kan ingetrek word op skriftelike kennisgewing deur die eienaar.

Die volgende private wildreserwes bestaan in Natal:—

(1) Die omheinde gebied van ongeveer 2·5 morge (5·3 *acres*) op die plaas Grootdraai No. 707, Distrik Ngotshe, op die oewers van die Pongolarivier reg teenoor die studam.

(2) Die plaas Boundary Slopes in die Magistraatsdistrik Ladysmith.

(3) Die plaas Goedverwachting in die Magistraatsdistrik Umgeni.

(4) Die plaas geregistreer onder die naam Gartmore te Waschbank in die Magistraatsdistrik Ladysmith.

(5) Die plaas Moe's Rest, voorheen bekend as Wilgespruit, in die Magistraatsdistrik New Hanover.

(6) Die plase Krantzkop No. 386, Verdrukt No. 444, Witkloof en Mooiplaats No. 255, bekend as die Bar C Ranch in die Magistraatsdistrik Ngotshe.

(7) Die plase geregistreer onder die name Vermaakskraal, Kalkfontein, Uithoek, Scheefnek, Kanonkop, Persberg, Glasgow en alle onderverdelings daarvan in die Magistraatsdistrik Helpmekaar.

(8) Die Gumtree Grove-pan geleë op die plaas Gumtree Grove in die Magistraatsdistrik Utrecht tesame met 'n stuk grond wyd 300 treë, wat aan genoemde pan grens.

(9) Plase Kalwerfontein, London, Lot N, Slaaf en Verraad wat almaal aanmekaar grens in die Magistraatsdistrik Helpmekaar.

BOS-NATUURSKOONRESERWES

Benewens die nasionale parke wat ingevolge die Wet op Nasionale Parke, No. 56 van 1926 gestig is en provinsiale, munisipale, private en ander reserwes wat ingevolge Provinsiale Ordonnansies gestig is, is daar 'n aantal bos-natuurskoonreserwes in Suid-Afrika. Hulle is geskep ingevolge artikel 8 van die Bos- en Veldbewaringswet, No. 13 van 1941 wat as volg lui: „Die Minister (van Landbou en Bosbou) kan 'n Kroonbos of 'n omskrewe gedeelte daarvan afsonder as 'n natuurskoonreserwe vir die bewaring van die natuurskoon, bosse, bome, *flora of fauna* daarin of as 'n skermbos vir die bewaring van watervoorrade of vir die voorkoming van waaisandbeweging of gronderosie."

Die hele boseiendom van die Unie beslaan 3,499,000 *acres* en is op die oomblik as volg saamgestel:—

	Acres.
Inheemse bos....................	638,000
Plantasies van uitheemse soorte (hoofsaaklik dennebome)........	402,000
Grond afgesonder vir verdere bosaanplanting..................	219,000
Ope sandduingebied wat nog herwin moet word................	40,000
Grond wat nie geskik is vir bosaanplanting nie en wat hoofsaaklik beskerm word as wateropvanggebiede.......................	2,200,000
TOTAAL............	3,499,000

Die boseiendom is oop vir die publiek en plekke van spesiale belang soos watervalle, groot bome, gebiede met ongerepte oerwoud en mooi gebiede waardeur paaie gaan, word vir hulle voordeel aangedui. Afgesien van die algemene beleid van die Departement om die hele boseiendom vir die nageslag te bewaar, is sekere gebiede wat nog min of meer in 'n ongerepte toestand bestaan, as natuurskoonreserwes afgesonder. Hulle is as volg:—

NATUURSKOONRESERWES VAN DIE DEPARTEMENT VAN BOSBOU.

I.	Westelike Bewaargebied (3,265·8 *acres*)	Algeria (Cedarberg), Kathleen Murray, Swartbos—Sosynskloof, Rooskraal, Assegaaibos, Sewefontein (Suurvlakte), Waterfall, Marloth Flower, Hout Bay.
II.	Middellandse Bewaargebied (7,743·8 *acres*)	Terblanz (Lelievleibos), Lelievlei, Kombos, Garden of Eden, Koffiehoek, Witels (Harkerville), Grooteiland, Fisanthoek, Petrus Brand, Spitskop, Modderlyn, Grootboom, Watervalbos, Streepbos, Forest Creek, Skelmskloof, Homtini, Kleinbos, Rooiwal, Keurboomsrivier, Grootrivier, Ratelsbos, Coldstream, Witelsbos, Klein-Witelsbos, Blouleliesbos, Die Plaat, Groenkop, Woodville, Jonkersberg, Geelhoutboomberg.
III.	Oostelike Bewaargebied.... (420·8 *acres*)	Pirie, Wolf Ridge, Nyokana, Loerie, Van Stadens Rivier.
IV.	Transkeise Bewaargebied.. (205·1 *acres*)	Caesar Henkel, Tonti, Dlokolwana, Dikadiki, Lighthouse Umbanyane.
V.	Natalse Bewaargebied..... (1,001 *acres*)	Umtamvuna, Bazeni, Mikobi, Xumeni.
VI.	Transvaalse Bewaargebied. (270·2 *acres*)	Helpmekaar, Patatabos, Lothair, Entabeni, Veraskop, Magalieskop.

Die totale aantal bos-natuurskoonreserwes is dus 61, met 'n oppervlakte van 12,906·7 *acres*.

PLAASLIKE NATUURTUINE

In die Unie is daar ook 'n aantal natuurtuine, meesal maar klein, wat deur plaaslike besture gestig is, veral in die Kaapprovinsie. Professor R. H. Compton(3) en F. R. Long(11) het verslag hiervan gedoen.

ERKENNINGS

Ek is baie dank verskuldig vir inligting en ander hulp aan die volgende: Die Provinsiale Sekretarisse van die Kaap die Goeie Hoop, van die Oranje-Vrystaat, van die Transvaalse Provinsie en van Natal; die Landmeters-generaal van Transvaal en Natal, die Direkteur van Besproeiing, die Stadsklerke van Bloemfontein en Bethulie, die Stadsingenieur van Pretoria, mnr. C. J. Voorendyk en dr. C. L. Wicht van die Departement van Bosbou, die Sekretaris van die Raad van Kuratore vir Nasionale Parke, mnr. S. Sewenster van die Departement van Lande, die Sekretaris van Lande, die Direkteur van Driehoeksmeting, die Sekretarisse van die Afdelingsrade van die Kaap en van Clanwilliam en die Hoofargivaris van die Unie van Suid-Afrika.

Fotos is goedgunstiglik deur die volgende beskikbaar gestel: Mnr. Dick Wolff, mnr. W. Schack, die firma Martin Gibbs, Bpk., die *Rand Daily Mail* en *The Star*.

Daar moet op die volgende ekwiwalente gelet word:—

1 morg = 2·1165 *acres*.
640 *acres* = 1 vierkante myl.

NASLAANWERKE.

(1) W. C. Baldwin. African Hunting from Natal to the Zambesi including Lake Ngami, the Kalahari Desert, etc., from 1852 to 1860. London, 1863.

(2) R. Bigalke. The Status of the Black Wildebeest [*Connochaetes gnou* (*Zimm.*)] in the Union of South Africa. *S.A. Journ. of Science*, Vol XLIII, July, 1947.

(3) R. H. Compton. Local Nature Reserves. *Journal of the Botanical Society of S. Africa*, Part XVIII, 1932.

(4) R. H. Compton. News and Notes. *Journal of the Botanical Society of S. Africa*, Part XXXI 1945.

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NASIONALE PARKE, NATUURRESERWES, WILDRESERWES EN NATUURTUINE VAN DIE UNIE VAN SUID-AFRIKA.

A. PROVINSIE TRANSVAAL.

I.—NASIONALE PARKE.

Naam.	Datum van Stigting.	Oppervlakte. acres.
1. Nasionale Kruger-wildtuin...................	15 September 1926.....	Ongeveer 5,097,004

II.—NATUURRESERWES.

Naam.	Datum van stigting.	Oppervlakte. acres.
2. Dongola-Natuurreserwe (Afgeskaf deur Wet No. 29 van 1949)	1 November 1947......	223,387·5.

III.—WILDRESERWES.

(a) *Provinsiale Wildreserwes.*

Naam.	Datum van Stigting.	Oppervlakte. acres.
3. Pafuri Wildreserwe.........................	5 Julie 1933...........	Ongeveer 40,639
4. Rust-der-Winter Wildreserwe................	29 Desember 1937......	13,462
5. Marico Bosveld Wildreserwe................	29 Desember 1937......	Ongeveer 17,257
6. Honnet Wildreserwe........................	18 Januarie 1939.......	4,700·5
7. Vaal-Hartz Wildreserwe....................	5 April 1939..........	Ongeveer 63,283
8. Loskop Wildreserwe........................	6 Maart 1940.........	Ongeveer 30,000
9. Barberspan Wildreserwe....................	13 April 1949..........	—

(b) *Munisipale Wildreserwes.*

Naam.	Datum van Stigting.	Oppervlakte. acres.
10. Dorpsgronden van Pretoria en Plaats Groenkloof (de Fonteinen)	1 Februarie 1895......	Ongeveer 17,122
11. Rietvalleise Reserwe vir Wild en Inheemse Flora	2 Junie 1937..........	9,746
12. Wonderboomse Reserwe vir Wild en Inheemse Flora	28 Desember 1949......	Ongeveer 296
13. Westdene Panse Reserwe vir Wild en Inheemse Flora	8 Februarie 1950......	—

B.—KAAP DIE GOEIE HOOP.

I.—NASIONALE PARKE.

Naam.	Datum van Stigting.	Oppervlakte. acres.
14. Nasionale Addo-Olifantepark	3 Julie 1931	16,925·2
15. Nasionale Bontebokpark	3 Julie 1931	1,784·4
16. Nasionale Kalahari-Gemsbokpark	3 Julie 1931	2,392,521·4
17. Nasionale Bergsebrapark	2 Julie 1937	3,547·1

II.—NATUURTUINE.

Afdelingsrade se Natuurtuine.

Naam.	Datum van Stigting.	Oppervlakte. acres.
18. Natuurtuin Kaap die Goeie Hoop	1 Februarie 1946	16,841
19. *Plaaslike Gebied van die Nortier Reserwe van Otterdam	3 Mei 1935	Ongeveer 6,350
20. Natuurtuin Robbeberg	17 September 1948	Ongeveer 433

* Ongelukkig word 'n eenvormige benaming in die Proklamasies nie deurgevoer nie.

C.—ORANJE-VRYSTAAT.

I.—WILDRESERWES.

(a) Provinsiale Wildreserwes.

Naam.	Datum van Stigting.	Oppervlakte. acres.
21. Vrystaatse Wildtuin	9 Oktober 1925	24,262·6 plus 4,465·58
22. Vaal-Hartz Wildreserwe (Wildtuin)	24 Maart 1939	Ongeveer 185,829

(b) Munisipale Wildreserwes.

Naam.	Datum van Stigting.	Ongeveer 468.
23. Franklin Wildreserwe	29 April 1929	Ongeveer 468
24. Mynhardt Wildreserwe	1933	265

D.—NATAL.

I.—NASIONALE PARKE.

Naam.	Datum van Stigting.	Oppervlakte. acres.
25. Koninklike Natalse Nasionale Park	19 September 1916	Ongeveer 20,000
26. Wildtuin Giant's Castle	18 Junie 1907 (6 Mei 1943).	Ongeveer 50,000

II.—WILDRESERWES.

(*a*) *Provinsiale Wildreserwes.*

Naam.	Datum van Stigting.	Oppervlakte. *acres.*
27. Hluhluwe Wildreserwe........................	27 April 1897..........	Ongeveer 40,000
28. Umfolosi Wildreserwe........................	27 April 1897..........	Ongeveer 72,000
29. Mkuzi Wildreserwe........................	15 Februarie 1912......	Ongeveer 62,000
30. Ndumu Wildreserwe........................	17 April 1924..........	Ongeveer 25,000
31. *St. Lucia Wildtuin........................	21 Maart 1935.........	Ongeveer 91,090
32. Richardsbaai Wildtuin........................	5 September 1935.....	Ongeveer 2,000
33. Sordwanabaai Wildreserwe.................	Nog nie geproklameer nie	Ongeveer 1,000

(*b*) *Natuurtuine.*

Naam.	Datum van Stigting.	Oppervlakte. *acres.*
34. Natuurtuin Enseleni........................	22 Januarie 1948.......	Ongeveer 725
35. Natuurtuin Umlalazi........................	5 Februarie 1948......	Ongeveer 540
36. Natuurtuin Coleford (Afgeskaf deur Prok. No. 15 van 1949)	4 Maart 1948.........	3,143
37. Natuurtuin Kosibaai........................	19 Januarie 1950.......	Ongeveer 50

* Ongelukkig word 'n eenvormige benaming in die proklamasies nie deurgevoer nie.
(Sien ook aantekenings op bladsy 35)

(*c*) *Private Wildreserwes.*

(Sien bladsy 35.)

E.—BOS-NATUURSKOONRESERWES.

Die getal is 61 met 'n gesamentlike oppervlakte van 12,906·7 *acres.*

F.—PLAASLIKE NATUURTUINE.

(Sien bladsy 37.)

Opskrif vir Kaart getitel „Kaart van die Unie van Suid-Afrika wat Nasionale Parke, Natuurreserwes, Wildreserwes en Natuurtuine aandui ”.

OPMERKING.—*In elke geval word die ligging aangedui deur middel van 'n nommer binne 'n sirkel, aidus* ②

No. 1. Nasionale Kruger-Wildtuin.

No. 2. Dongola-Natuurreserwe. (Afgeskaf deur Wet No. 29 van 1949).

No. 3. Dorpsgronden van Pretoria en Plaats Groenkloof (de Fonteinen) Reserwe

No. 4. Rietvalleise Reserwe vir Wild en Inheemse Flora.

No. 5. Wonderboomse Reserwe vir Wild en Inheemse Flora.

No. 5a. Westdene Panse Reserwe vir Wild en Inheemse Flora.

No. 6. Pafuri Wildreserwe.

No. 7. Rust-der-Winter Wildreserwe.

No. 8. Marico Bosveld Wildreserwe.

No. 8a. Barberspan Wildreserwe.

No. 9. Honnet Wildreserwe.

No. 10. Vaal-Hartz Wildreserwe (Transvaal).

No. 11. Loskop Wildreserwe.

No. 12. Nasionale Addo-Olifantepark.

No. 13. Nasionale Bontebokpark.

No. 14. Nasionale Kalahari-Gemsbokpark.

No. 15. Nasionale Bergsebrapark.

No. 16. Natuurtuin Kaap die Goeie Hoop.

No. 17. Natuurtuin Robbeberg.

No. 18. Plaaslike gebied van die Nortier Reserwe van Otterdam.

No. 19. Vrystaatse Wildtuin (Somerville Wildreserwe).

No. 20. Vaal-Hartz Wildreserwe (O.V.S.).

No. 21. Mynhardt Wildreserwe.

No. 22. Franklin Wildreserwe.

No. 23. Koninklike Natalse Nasionale Park.

No. 24. Hluhluwe Wildreserwe.

No. 25. Umfolosi Wildreserwe.

No. 26. Wildtuin Giant's Castle.

No. 27. Ndumu Wildreserwe.

No. 28. St. Lucia Wildtuin.

No. 29. Richardsbaai Wildtuin.

No. 30. Mkuzi Wildreserwe.

No. 31. Sordwanabaai Wildreserwe.

No. 32. Natuurtuin Coleford (Afgeskaf deur Prok. No. 15 van 1949)..

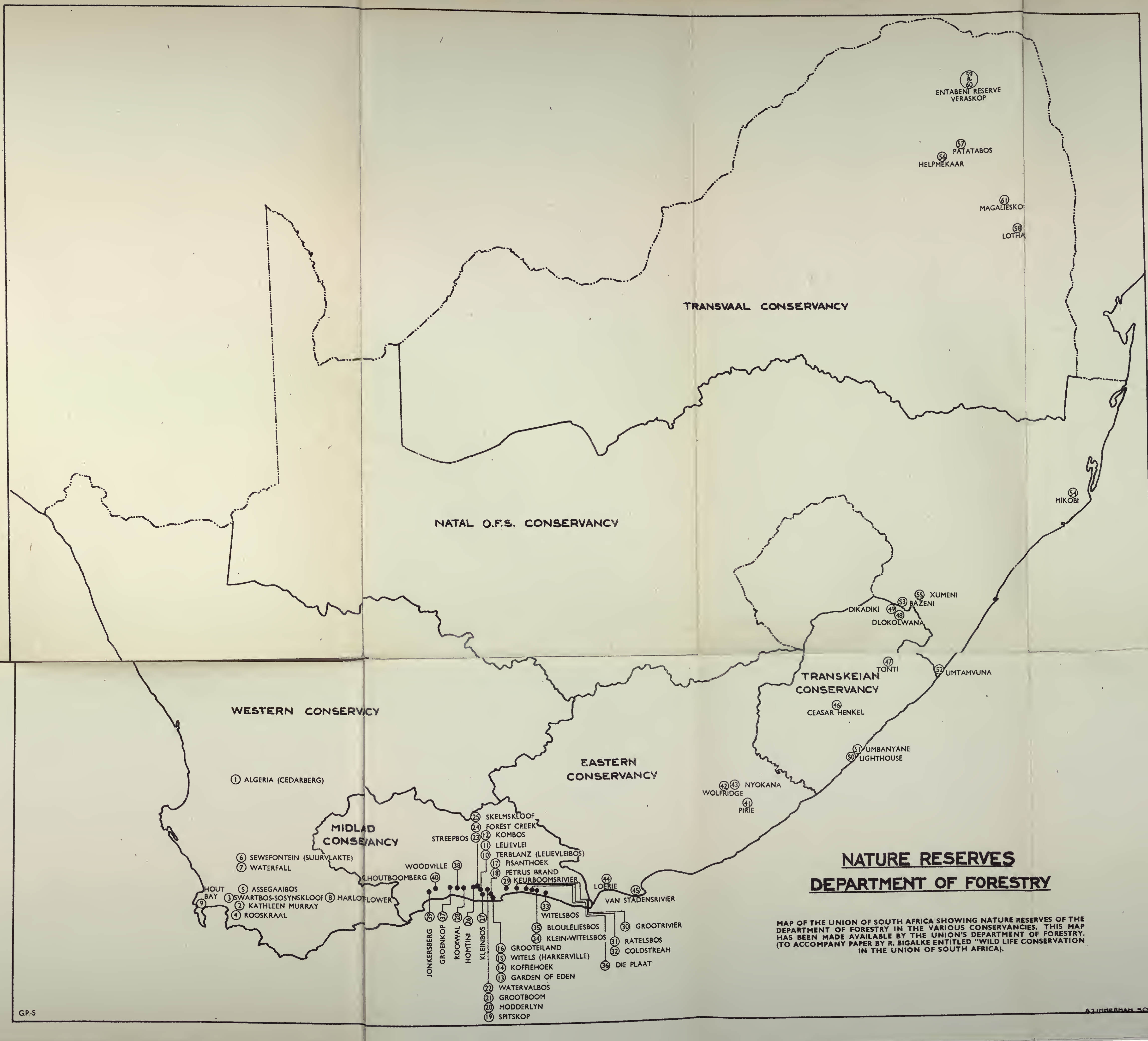
No. 33. Natuurtuin Enseleni.

No. 34. Natuurtuin Umlalazi.

No. 35. Natuurtuin Kosibaai.

Die Landmeter-generaal van Transvaal word hartlik bedank vir hierdie kaart

DIE STAATSDRUKKER, PRETORIA



NATURE RESERVES
DEPARTMENT OF FORESTRY

MAP OF THE UNION OF SOUTH AFRICA SHOWING NATURE RESERVES OF THE DEPARTMENT OF FORESTRY IN THE VARIOUS CONSERVANCIES. THIS MAP HAS BEEN MADE AVAILABLE BY THE UNION'S DEPARTMENT OF FORESTRY. (TO ACCOMPANY PAPER BY R. BIGALKE ENTITLED "WILD LIFE CONSERVATION IN THE UNION OF SOUTH AFRICA).

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Feeding Trout at the Provincial Fisheries Institute, Lydenburg

Forelle word gevoer by die Provinsiale Visseryinstituut, Lydenburg

FAUNA AND/EN FLORA

an official publication of the Transvaal Provincial Administration

'n offisiële publikasie van die Transvaalse Provinsiale Administrasie

ADVISORY BOARD RE FAUNA AND FLORA TRANSVAAL.

17 NOVEMBER 1950

RAAD VAN ADVIES INSAKE FAUNA EN FLORA, TRANSVAAL.

17 NOVEMBER 1950

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SUMMER TROUT

by

S. S. du PLESSIS

Provincial Fisheries Institute, Lydenburg.

THE annual stocking of some trout waters form part of the development and maintenance of trout fishing in Transvaal. The reasons for restocking are that in dry years the natural propagation is not sufficient to maintain a full population. Hailstorms also take a severe toll of trout because the hail causes the temperature to drop so suddenly that the fish succumb. Artificial lakes have to be restocked annually because spawning facilities are not adequate. There are also numerous potential trout waters in the Province which have never been stocked before. The demand for trout from private farmers at high altitudes is also increasing every year.

The trout eggs have in the past been obtained from hatcheries in the Cape, but owing to a shortage of eggs it became necessary to import them from England since 1948. In the winter of 1951 the Provincial Fisheries Institute at Lydenburg will start producing trout eggs and then the importation of eggs will not be necessary any more.

The greatest difficulty with imported eggs lies in the fact that they arrive here in the middle of summer. Trout breed during the winter and the eggs require cold, clear running water for hatching out properly. As described

SOMERFORELLE

deur

S. S. du PLESSIS

Provinsiale Visseryinstituut, Lydenburg.

DIE beplanting van waters met forelle vorm 'n belangrike deel van die instandhouding van die forelhengel in Transvaal. Die belangrikste redes hiervoor is dat daar in swak jare nie genoegsame natuurlike vermeerdering van wilde forelle in die riviere is nie. Haelstorms doen ook baie skade in forelwaters deurdat die water so skielik afkoel dat die visse daarvan omkom. In mere is daar nie geskikte broeiplekke nie en daarom moet hulle ook jaarliks klein vissies kry. Daar is in Transvaal ook baie koel helder waters waar daar nog nooit vantevore forelle losgelaat is nie en waar hulle ook nou ingevoer word. Boere stel ook alhoemeer belang in vis vir hulle plaasdame en in Hoëveldse damme met skoon water en wat deur fonteine gevoed word aard forelle baie goed.

In die verlede is foreleiers vanaf visteelstasies in die Kaapprovinsie ingevoer, maar weens 'n groot tekort aan eiers word dit sedert Desember 1948 elke somer vanaf Engeland ingevoer. Die Provinsiale Visseryinstituut te Lydenburg sal vanaf Junie 1951 self foreleiers produseer en dan sal die invoer nie meer nodig wees nie. Die ingevoerde eiers word uitgebroei en die kleintjies word grootgemaak tot 'n lengte van 4 duim voordat hulle in riviere, mere en damme losgelaat word. Die groot probleem in verband met die in-later this difficulty was successfully overcome by erecting a small wooden hatching house at a high altitude near the source of a stream.

TRANSPORT OF EGGS.

Mainly rainbow trout eggs are imported into Transvaal. These are transported by air to Palmietfontein whence they are brought to Lydenburg by car. It is not necessary to open the egg box at the airport unless there has been a long delay en route. When eggs are well packed re-icing is not necessary. When ice has to be replenished clear, frozen river or spring water should be used and not factory ice. When transporting eggs by car it is advisable to place the box on the back seat in a slight draught and not on the hot floor of the car. Eggs should go straight to the hatching house without unnecessary delay. The fact that the ice is not melted should not be taken as an indication that the consignment can be delayed. The eggs are not in water and inside the insulated box there is a minimum of oxygen in the air. Therefore the eggs should be transferred to water as soon as possible. Bumping and jarring must be avoided.

ACCLIMATISATION OF THE EGGS TO NEW TEMPERATURE.

The eggs are usually packed in a double aluminium box with thick cork insulation. The eggs lie on small trays which have thin wooden frames with a bottom of flannel cloth. The eggs lie in a single layer on the cloth, and the frames are just thick enough to leave enough room for the eggs when the trays are stacked in the box. On

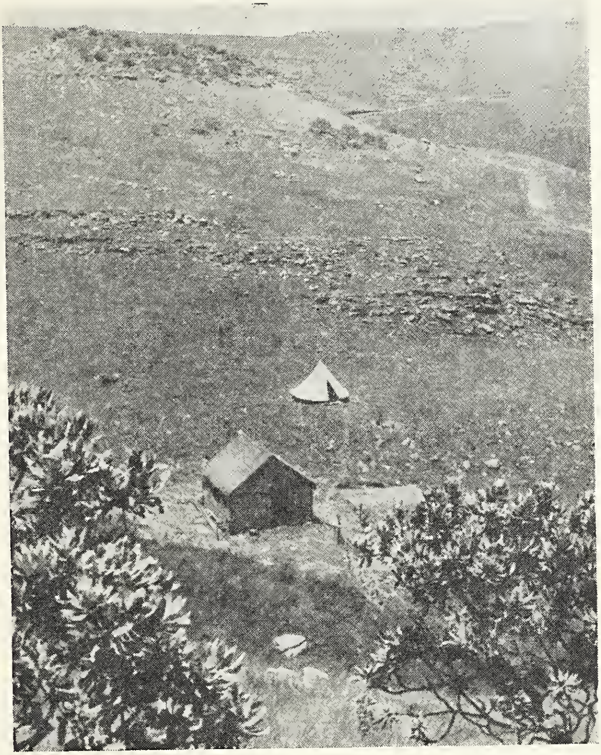
voer van foreleiers uit die Noordelike Halfrond is dat hulle hier aankom in die middel van die somer. Forelle broei in die winter en hulle het koue, suurstofryke, helder, lopende water nodig om uit te broei. Soos later beskrywe word is hierdie moeilikheid oorkom deur 'n spesiale houthuisie bo-op die berge, naby die oorsprong van 'n forelrivier op te rig, om die eiers in uit te broei.

VERVOER VAN EIERS.

Hoofsaaklik eiers van die reënboogforel word ingevoer. Dit word vanaf Engeland na Palmietfontein vervoer per vliegtuig en daarvandaan na Lydenburg per motor. Dit is onnodig om die kas by die vlieghawe oop te maak tensy die vliegtuig lank vertraag was, want as die eiers goed verpak is, is dit nie nodig om weer ys in te sit nie. As dit nodig is om die ys te vernuwe, moet slegs bevrore fontein- of rivierwater gebruik word en nie fabriekys nie. In die motor is dit beste om die kas eiers op die agterste sitplek neer te sit en nie op die warm vloer van die kar nie. Onnodige stampe moet vermy word. Die eiers moet direk na die broeihuis gaan, en so gou moontlik in die water kom.

AANPASSING VAN DIE EIERS BY DIE NUWE TEMPERATUUR.

Die eiers word gewoonlik verpak in 'n aluminiumkas met kurkinsulasie. Die eiers lê op klein laaitjies met dun houtraampies, en bodems van flenniedoek. Die eiers word in enkele lae op die doek verpak en die raampies is net dik genoeg om te verhoed dat hulle deur die boonste laaitjies platgedruk word. Die laaitjies met eiers



The temporary hatchery for hatching trout eggs in summer on Makobulaan Forest Reserve.
Die tydelike broeihuisie vir uitbroei van foreleiers in die somer op Makobulaan Bosreserwe.

top of the egg trays is an ice tray. The ice keeps the eggs cool and moist.

Upon the arrival at the hatching house a screwdriver is usually required to open the egg box. Remove the tray of ice on top of the eggs and take the temperature of the air in the box. In well packed eggs this is usually in the vicinity of 45° F. Fill a 3-gallon bucket with hatchery water and add ice until the temperature is exactly the same as that of the interior of the egg box. Remove the trays of eggs and place them on the ground in a level position with a clearance of about

word in die kas opmekaar gestapel en heel bo-op 'n laai met ys. Die ys hou die eiers klam en koud want in die kas is daar geen water nie.

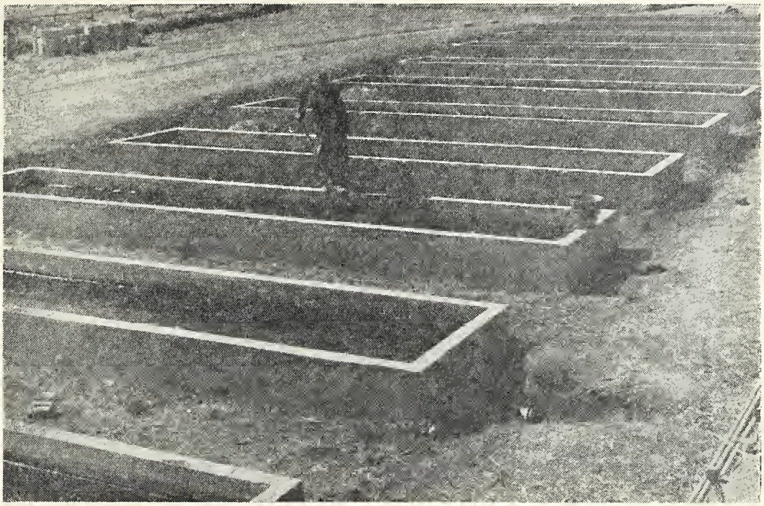
By die broeihuis word die kas oopgemaak en die laai met ys verwyder. Neem nou eers die temperatuur van die lug binne in die kas. In goed verpakte besendings is dit in die omgewing van 45° F. Maak 'n drie gelling emmer vol van die broeihuis se lopende water en voeg ys by totdat die temperatuur presies dieselfde is as in die eierkas. Die laaitjies met eiers is gewoonlik in 'n pakkie gebind. Hierdie

1½ inches underneath. Put the bucket of iced water on a box about one foot from the ground and siphon water from the bucket on to the trays of eggs with a ¼-inch soft rubber tube. Make sure that the water reaches all parts of the packet of eggs. Keep the water at the same temperature for about 45 minutes and then slowly raise by adding hatchery water. The temperature of the water in the bucket can be very well regulated by adding hatchery water or ice. Raise the temperature about three degrees every hour. There should never be a difference of more than two degrees between water entering the packet of eggs at the top and water draining out below. When the temperatures of the hatchery water, the water in the bucket and water draining from the eggs are the same, water can run over the eggs for another half hour before transferring them to the hatching troughs. The process of acclimatisation takes from 3 to 4 hours.

pakkie word op die grond neergesit in 'n waterpas posisie met 'n ruimte van ongeveer 1½ duim onder die pakkie. Die emmer yswater staan op 'n kassie ongeveer 1 vt. van die grond en die water word met 'n ¼ duim rubberbuisie uit die emmer oor die eierlaaitjies gehewel, sodat die water al die eiers bereik. Na 45 minute kan die temperatuur van die emmer se water stadig verhoog word deur byvoeging van broeihuiswater. Die temperatuur van die water kan baie akkuraat gereguleer word deur òf ys òf water by te voeg. Die temperatuur moet drie grade per uur styg en daar behoort nooit 'n verskil van meer as twee grade te wees tussen die water wat bo-op die pakkie eiers val en wat onder uitloop nie. Wanneer die temperatuur van die broeihuisie se water en water wat onder by die pakkie eiers uitloop dieselfde is, moet die water vir nog 'n halfuur oor die eiers loop voordat hulle in die broeibakke oorgeplaas word. Die akklimatisering van die eiers neem van 3 tot 4 uur.

A view of the circular trout rearing tanks at the Provincial Fisheries Institute, Lydenburg. In the background are earthen ponds.

Uitsig op die ronde grootmaaktenks by die Provinsiale Visseryinstituut, Lydenburg. In die agtergrond is gronddamme.



In hierdie tenks word Daphnia (watervlooie) geteel om klein forelle op te voer.
In these tanks Daphnia (water fleas) are cultured for feeding small trout.

It is convenient to have a hatching boat available for every tray of eggs. While trays of eggs are being transferred to hatching boats it is advisable to keep water running over the packet of eggs; this prevents eggs adhering to the bottom of the tray just above them. Eggs are floated off the trays into the boats and should lie on the perforated bottom in a single layer. They can be moved into position by gently shaking the boat, or by lifting and slowly lowering it, keeping the eggs under water all the time.

Hatching boats fit nicely into the wooden hatching troughs, thus preventing the water from flowing around the sides of the boat instead of through the perforated zinc and over the eggs. The bottom of the hatching boat is elevated about $\frac{1}{4}$ inch from the bottom of the trough to prevent silt from settling on the eggs and to ensure a current of water under the eggs.

WATER SUITABLE FOR SUMMER HATCHING.

Water of a suitable temperature is undoubtedly the most important factor in successful summer hatching of trout

Gerieflikheidshalwe moet daar 'n eierskuitjie gereed gehou word vir elke laaitjie eiers. Eierskuitjies het aan drie kante gaasdraad of gaaitjiesink en pas mooi in die broeibak sodat die water slegs deur die gaaitjies en oor die eiers vloei. Die bodem van die skuitjie is ongeveer $\frac{1}{4}$ duim van die bodem van die broeibak om te verhoed dat afsaksel wat op die bodem afsak die eiers versmoor, en ook om 'n stroom van water onderdeur die eiers te hê. Terwyl die eierlaaitjies oorgeplaas word is dit wenslik om die water nog oor die pakkie eiers te laat loop. Dit hou hulle nat en verhoed dat eiers onder aan die bodem van die boonste laaitjies vaskleef as mens hom oplig. Die laaitjie word in die eierskuitjie gesit en die eiers toegelaat om van die laaitjie af in die skuitjie te dryf. Hulle moet in 'n enkele laag op die sifbodem van die skuitjie lê.

GESKIKTE WATER VIR SOMERBROEI VAN FORELEIERS.

Water van 'n geskikte temperatuur is ongetwyfeld die belangrikste faktor in die suksesvolle somerbroei van eggs. The coldest water in Transvaal is found at altitudes of above 6,000 ft., in headwaters of trout streams. Water issuing from underground on the Makobulaan Forest Reserve near Lydenburg, at an altitude of 6,500 ft., had a temperature of 57° F. in October. After the rains had started and the flow increased the temperature varied between 58° F. and 59° F. The reason is probably the more superficial origin of the water in the rainy season, as compared to the October underground water coming from deeper sources.

Care was taken to select a well shaded brook and to use the water after it had run for about 100 yards. This was to eliminate the possibility of harmful influences from oxygen deficiency. The furrow taking the water into the small coir filter as well as the filter itself were shaded with grass. The filter was constructed so that the water entered the bottom and rose upwards through a 12-inch layer of coir to the intake pipe near the surface. A piece of netting wire stretched vertically across the filter prevents the coir from blocking the intake pipe. All surplus water runs past the filter so that only water used for the hatching troughs is filtered. Such a filter with dimensions of 3 ft. by 2 ft. by 18 inches deep filters about 35 gallons a minute and removes 90 per cent. of the silt. It must be cleaned every second day.

The flow of water required in summer hatching is about double the flow needed at lower temperatures. For a 12 ft. trough carrying 20,000 eggs a flow of 8-9 gallons a minute was found to be sufficient. Both in the 1949 and 1950 summers temperatures of the hatching water ranged between 57° F. and 65° F. The average during daytime was between 60° F. and 63° F. On hot days it seldom went up to 65° F. at midday. This is considerably higher than the winter temperatures which vary between 45° F. and 52° F. Under conditions of such high temperatures only eggs of a very

foreleiers. Die koudste water in Transvaal in die somer is op 'n hoogte van meer as 6,000 voet by die oorsprong van bergstrome. Op die die Makobulaan Bosreserwe naby Lydenburg op 'n hoogte van 6,500 voet het die fonteinwater in Oktober 'n temperatuur van 57° F. As die fonteine sterk word na die eerste reëns dan wissel die temperatuur tussen 58° F. en 59° F. Die rede vir die hoër temperatuur is heelwaarskynlik dat die ondergrondse water in die reëntyd nie so diep ontspring as voor die reëns nie.

'n Goedbeskutte stroompie wat heeltyd in die skaduwee loop is uitgekies om verhitting van die water deur direkte sonstrale uit te skakel. Om seker te maak dat daar genoeg suurstof in die water is, is dit gebruik eers nadat dit omtrent 100 tree geloop het. Die uitkeervoortjie en die filter word met gras bedek. Water kom in die filter in naby die bodem en styg dan op deur 'n 12 duim laag klapperhaar. Die pyp wat die water na die broeihuisie neem is naby die oppervlakte met 'n stuk gaas om die bek. Om te verhoed dat klapperhaar teen die pyp se bek pak word 'n stuk sifdraad 'n paar duim van die pyp af regop in die filter gespan. Alle surplus water loop verby die filter sodat slegs water wat gebruik word gefiltreer word. Die filter is 3 voet by 2 voet by 18 duim diep en filtreer ongeveer 35 gelling per minuut. Dit verwyder 90 persent van die afsaksel en moet elke tweede dag skoongemaak word.

Vir somerbroei van foreleiers word tweekeer soveel water benodig as vir die winter. Agt tot nege gellings per minuut is genoeg vir 'n 12 vt. broeibak wat 20,000 eiers dra. In die somers van 1949 en 1950 het die temperatuur van die broeihuis se water gewissel tussen 57° F. en 65° F. Die gemiddelde gedurende die dag was tussen 60°F. en 63° F. Op baie warm dae het dit somtyds gestyg tot 65° F. op die middag. Dit is aansienlik hoër as die wintertemperatuur, wat wissel tussen 45° F. en 52° F. By sulke hoë temperature kan goeie resultate slegs verkry word met hoë kwaliteit eiers, good quality, preferably from wild or halfwild fish can give good results. Even so the percentage hatching is proportionately lower than in winter. The greatest losses occur during hatching of the eggs, when some burst open and others which hatch head first die in the process. During yolk absorbtion losses remain more or less constant up to the stage when they start to swim and feed.

In 1949 two consignments of 20,000 and 30,000 eggs were imported from England. Up to the stage when they started feeding losses amounted to 13·9 per cent. in the first consignment and 22·4 per cent. in the second. Eventually 65 per cent. were available for distribution in rivers at lengths varying from 3 inches to 5 inches according to the time they were released.

In 1950 150,000 eggs were imported from three hatcheries in England. Losses up to the feeding stage varied as follows: 43·45 per cent., 26·2 per cent., 30·9 per cent. with an average loss of 36·7 per cent.

During 1949 when eggs were hatched near Sabie, the fry were reared in the same water for about one month before they were brought over to Lydenburg. In 1950 they were brought direct from the hatching house at Makobulaan to the main hatchery at Lydenburg for rearing. Here the water temperatures normally range between 62° F. and 69° F. during January and February with occasional rises to 70° F. On an exceptionally hot day it rises to 72° F. at 2 p.m. Fry have been successfully raised under such conditions without any signs of distress. Rainbow fry have been found to feed greedily at a temperature of 72° F. A strong flow of well aerated water is essential under such conditions. The small fish are fed on minced liver and water fleas (Daphnia).

When the fry start to swim feeding with minced liver is very difficult, and they are fed mainly on Daphnia with small feedings of liver in between. As soon as they take liver freely the

verkieslik van wilde of halfwilde visse. Selfs dan is die verliese hoër as in die winter. Die grootste verliese word gely wanneer die kleintjies uit die eiers kom. Baie eiers bars oop terwyl sommige kleintjies wat met die kop eerste uitkom doodgaan voordat hulle gebore is. Terwyl die dooiersak geabsorbeer word is verliese konstant en taamlik hoog totdat die vissies begin swem en eet.

In 1949 is twee besendings van 20,000 en 30,000 eiers uit Engeland ingevoer. Die verliese tot by die stadium wanneer hulle begin eet was 13·9 persent in die eerste en 22·4 in die tweede besending. Vyf-en-sestig persent was uiteindelik beskikbaar vir verspreiding in riviere op lengtes wat gewissel het van 3 tot 5 duim, na gelang van ouderdom. Op 150,000 eiers wat in 1950 ingevoer is van drie teelstasies in Engeland was die verliese as volg: 43·45 persent, 26·2 persent, 30·9 persent, met 'n gemiddelde verlies van 36·7 persent tot op die stadium wanneer hulle begin eet het.

In 1949 toe die eiers naby Sabie uitgebroei is, is die klein vissies vir 'n maand in dieselfde water grootgemaak voordat hulle na die Visseryinstituut op Lydenburg oorgebring is. In 1950 het die broeihuis op Makobulaan gestaan en daarvandaan is die kleintjies direk na Lydenburg geneem vir grootmaak. Hier wissel die watertemperatuur tussen 62° F. en 69° F. gedurende Januarie en Februarie. Af en toe styg dit tot 70° F. terwyl dit op 'n baie warm dag selfs 72° F. kan bereik. Klein forelle is met sukses onder hierdie omstandighede grootgemaak; klein reënboogforelle eet gretig by 'n temperatuur van 72° F. 'n Sterk stroom van suurstofryke water is onder sulke omstandighede absoluut noodsaaklik. Die klein vissies eet gemaalde beeslewer en Daphnia, klein skaaldiertjies wat spesiaal vir hulle geteel word.

Wanneer die klein vissies begin swem is dit moeilik om hulle op lewer te voer en hulle kry hoofsaaklik Daphnia met klein bietjies lewer tussenin. Sodra hulle geleer het om number of liver feedings per day are increased to roughly one every hour. When temperatures exceed 69° F. they are fed on Daphnia only. To ensure that there is a constant supply of Daphnia during the day a can of water containing Daphnia is placed at the head of each trough and Daphnia water is siphoned in with a $\frac{1}{4}$-inch rubber tube. At first the Daphnia is sifted through cheese cloth and only the small ones are fed to the fish, but after 10 days the fry are able to swallow larger Daphnia and sifting is discontinued. Daphnia gives rainbow and brown trout a beautiful colour. Rainbows at the age of 2 months have bright red fins and a distinct pink line along the side. At this age brown trout already show bright red spots on their sides. Such fish are exceptionally healthy and vigorous.

They are kept in 8 ft., rearing troughs for 2 to 3 weeks before being transferred to circular rearing ponds.

Fry are transferred to 20 ft., diameter circular rearing tanks at the rate of not more than 4,000 per tank. It was found that when 5,000 rainbow fingerlings are held in a 20 ft. circular tank they tend to wear their dorsal fins out from being too close together. The edge of the dorsal fin becomes white and thickened. Afterwards it may be worn away to about half its original size with the fin rays sticking out. No sign of bacterial or fungus infection could be detected, and upon thinning out the fish the dorsal fins healed within a week. This condition is caused by the fish rubbing against each other and causing irritation of the dorsal fin. Eroded fins as a result of overcrowding was also experienced in U.S.A.

Shade over the rearing tanks is essential, because it affords shelter to the fish and also prevents over-heating of the water. Grass shelters in the form of a piece of thatched roof of which one side rests on two short legs and the other side rests on the side of the tank was found very satisfactory, and they are now even used in winter rearing of trout. When netting or

die lewer te eet kry hulle elke uur lewer. As die temperatuur hoër as 69° F. gaan is dit wenslik om slegs Daphnia te voer. Om te verseker dat daar 'n konstante voorraad Daphnia gedurende die dag is, word 'n kan water met Daphnia op die bo-ent van elke houtbak neergesit en die Daphnia water loop met 'n rubberpypie in die houtbak in. Aan die begin word die Daphnia gesif deur kaasdoek en slegs die kleintjies word aan die vissies gevoer. Na 10 dae is hulle egter groot genoeg om volwasse Daphnia te eet. Daphnia geen jong forelle 'n pragtige kleur; op 2 maande ouderdom het klein reënboogforelletjies ligrooi vinne en 'n duidelike rooi streep langs die sye. By hierdie ouderdom het die bruinforel alreeds die rooi spikkels op die sye. Sulke vissies is baie gesond en lewendig. Die kleintjies woon in 8 vt. houtbakke met lopende water vir 2 of 3 weke voordat hulle oorgeplaas word in ronde grootmaaktenks van 20 vt. deursnit. In so 'n tenk word nie meer as 4,000 visse gehou nie. Wanneer 5,000 of meer klein forelle in so 'n tenk gehou word skuur hulle te veel teenmekaar met die gevolg dat die rugvinne verweer. Die rand van die rugvin word wit en verdik en naderhand kan dit verweer tot die helfte van die oorspronklike grootte, terwyl die vinstrale uitsteek. Geen teken van bakteriële- of swambesmetting kon waargeneem word nie, en as die vis uitgedun word herstel die vinne binne een week. Verweerde rugvinne as gevolg van digte konsentrasie van vis is ook in V.S.A. waargeneem by die reënboogforel.

In die somer is dit noodsaaklik om skaduwee oor die grootmaaktenks te hê, want dit bied nie alleen skuiling vir die visse nie, maar verhoed ook dat die water te warm word. Skuilings van dekgras word hiervoor gebruik. Die een kant rus op die rand van die tenk en die anderkant staan op twee pote in die water. Wanneer die tenk genet of leeggemaak word kan hierdie

emptying the tank this lightweight shelter is easily removed. It covers about one-fifth of the surface of the tank and lies 9 inches above the water surface. On hot sunshine days the fish all lie in the shade during the hot part of the day, and we sometimes have two shelters on each tank. The shy brown trout always have two shelters, because it encourages them to feed more freely.

As soon as the fish are big enough, white ants are added to their diet, mixed with beef liver. This is excellent food. Ant heaps are collected in the veld and left near the tanks for one night. The next day the ants have all concentrated in the middle of their anthills. The pieces are now broken up and the ants collected as follows: A drum is half filled with water and a narrow plank rested over the top opening. The pieces of anthill are knocked on this plank which breaks it up further. The earth drops to the bottom of the drum and the ants and pieces of stick and grass float on the water surface, where they are scooped up with a little dipnet and put in another drum of water. By hitting the layer of ants and grass sticks in the second drum with the palm of the hand the ants, which are now partly waterlogged, sink to the bottom. After the grass has been scooped from the surface they are collected by pouring the water from the second drum through a fine meshed handnet. This method is quite simple and the food is very cheap and nutritious. Once they get used to it the fish almost prefer the ants to liver.

Under summer conditions at Lydenburg the trout fry grow very fast and at the age of 3 months they attain a length of 3 to 4 inches.

DISTRIBUTION.

The fingerlings are released in rivers at a length of 3 to 4 inches. They are transported by weight only. Before loading the fish they are kept without food for at least 20 hours to clean their stomachs. Hundred fish are counted and weighed. The number of

ligte skerm maklik verwyder word. Dit bedek ongeveer een-vyfde van die tenk en lê 9 duim bokant die wateroppervlakte. Op warm dae lê die vis almal in die skaduwee van die skerms en somtyds word twee skerms op elke tenk gesit. Omdat die bruinforelle baie skugter is kry hulle tenks altyd twee skerms, dan is hulle nie so wild nie.

Wanneer die vissies groot genoeg is word rysmiere by hulle dieet gevoeg. Die miershope word in die veld versamel en naby die tenks neergesit vir een nag, dan kruip al die miere na die middel van die miershoop toe. Die hope word nou stukkend gebreek en die miere word soos volg versamel: 'n Petroldrom word half met water gemaak en 'n smal plankie oor die opening gesit. Die stukke miershoop word op die planke gestamp en dit breek hulle op in klein stukkies wat almal na die bodem van die drom sink terwyl die miere en stukkies gras bo dryf. Laasgenoemde word nou met 'n klein handnetjie afgeskep en in 'n ander bak met water gegooi. Die miere is nou al halfpad verdrink en as die oppervlakte van die water in die bak met die handpalm of 'n plankie liggies geslaan word sink die miere na die bodem en die stukkies gras wat bo dryf word met 'n skepnet verwyder. Gooi nou die water met miere deur 'n fyn handnetjie en hulle is gereed vir die vis. Hierdie metode is baie eenvoudig en die kos is goedkoop en voedsaam. As die vis eers gewoond is aan die miere, verkies hulle dit bo lewer.

In die somer groei die forelle vinnig by Lydenburg en op drie maande ouderdom is hulle van drie tot vier duim lank.

VERVOER VAN FORELLE.

Die jong forelle word in die riviere losgelaat wanneer hulle 3 tot 4 duim lank is. Voordat die vis vervoer word bly hulle sonder kos vir 20 uur om hulle mae leeg te maak, sodat hulle uitskeidings nie die water besoedel nie. Honderd vis word nou getel en geweeg

fish that can be transported in a container is then estimated. By experiment the weight of fish that a container can carry at a certain temperature is known; we have never lost fish by this method of transport. On long trips fresh water is sometimes added from suitable streams, but only when the water from the river is colder than that in the containers. While stopping on the road water is scooped from the containers and poured back for aeration, when oxygen is not available.

The weight of fingerlings usually carried at temperatures below 55° F. without oxygen never exceeds 8 lb. per 50 gallon container. Trips of over 200 miles are done overnight and the weight of fish per container is reduced to 6½ lb. At first 44-gallon drums were used, but at present we use wooden cans made on the same model as those used at the Jonkershoek Hatchery. They are much more satisfactory, because of the bigger ratio between volume and surface area. On long journeys the water in these wooden cans were found to be 2 degrees cooler than the water in drums. When fitted with oxygen cylinders these containers carry many more fish.

A can of spare water is always taken for emergencies; this water also serves to fill the buckets in which the fish are carried from the lorry to the river. Upon arrival at the river, fish are transferred into buckets of fresh water. When oxygen is not available, they are removed from all containers at the same rate in order to avoid suffocation while the lorry is standing still. When long walks through the veld are necessary carriers have a small tin with which the water in the bucket is poured at intervals for aeration. When walking along the river fresh water from the stream is added.

Fingerlings are released in all sections of a river. Relatively shallow water with good shelter is preferred for

en daarvolgens word bereken hoeveel 'n kan kan dra. Deur eksperiment is die gewig vis wat 'n kan kan dra by 'n gegewe temperatuur bepaal, en daar is nog nooit vis verloor met hierdie metode van vervoer nie. Op lang reise word water van geskikte riviere somtyds bygevoeg, maar slegs wanneer daardie water kouer is as dié in die kanne en as suurstof nie beskikbaar is nie.

'n 50-gelling kan dra by temperature onderkant 55° F. en sonder suurstof nie meer as 8 lb. forelvingerlinge nie. Ritte van langer as 200 myl word gedurende die nag gedoen en die gewig vis word verminder na 6½ lb. per kan. Vier-en-veretig-gelling oliedromme wat aan die begin gebruik is, is nou vervang deur 50-gelling houtkanne wat op dieselfde patroon gemaak is as dié wat by die Jonkershoek Binnelandse Visbroeiery, Stellenbosch, gebruik is. Hulle is meer bevredigend as dromme omdat hulle in verhouding tot die volume water 'n groter wateroppervlakte het. Op lang reise bly die water in hierdie houtkanne 2 grade kouers as in dromme. As suurstof gebruik word dra hierdie kanne baie meer vis.

'n Kleiner kan spaarwater word altyd saamgeneem in gevalle van lekkasie of ander teëspoed. Hierdie spaarwater word ook gebruik om die emmers vol te maak waarin die vis van die vragmotor na die riviere gedra word. By die rivier aangekom word die vis in emmers vars water oorgeplaas. Wanneer suurstof nie beskikbaar is nie is dit nodsaaklik dat vis om die beurt uit al die kanne uitgehaal word, om te verhoed dat vis doodgaan weens gebrek aan suurstof terwyl die vragmotor stilstaan. Wanneer die emmers vis vir lang ente deur die veld gedra word, het elke draer 'n klein blikkie en daarmee moet hy die water met tussenposes skep en weer teruggooi om surrstof in die water te kry. Wanneer die paadjie langs die rivier is word vars water uit die stroom bygevoeg. Vingerlinge word in alle dele van 'n forelstroom losgelaat; betreklik vlak water met goeie skuiling word verkies. Hulle word egter ook

releasing them. They are also released at the tail ends of bigger pools, but never at the head of a pool. In lakes they are released in shallows with good shelter.

In the Transvaal the winter climate is ideal for stocking with trout because the rivers are never in flood, the water is clear, and the roads are dry. Results of one year's winter stocking have been very promising. Fish introduced in the winter of 1949 as 4-inch fingerlings reached the legal size of 10 inches in a number of rivers by April 1950. In many rivers they were showing up very well on account of the fact that their size was intermediate between that of yearlings and fingerlings from the previous winter's natural breeding.

This experiment has emphasized the remarkable adaptability of the rainbow trout under a variety of conditions, and it further indicates the advantages of stocking with fingerlings as compared to the introduction of fry. Nevertheless the importation of eggs was only an interim measure, made necessary by the acute shortage of local supplies of eggs.

So far we are fortunate enough to be relatively free from trout diseases in Transvaal and, unless it is absolutely necessary, the importation of trout eggs even with disease-free certificates is not recommended.

When handling the imported eggs one is struck by the total absence of deformities in the alevins. Eggs stripped from the imported fish in 1950 were also free from deformities. Mr. D. F. Leney of the Surrey Trout Farm in England is of the opinion that incorrect feeding and high temperatures have an important bearing on the occurrence of deformities. In South Africa where relatively high water temperatures are common these factors deserve to receive special attention amongst fish culturists who wish to produce high quality trout eggs.

losgelaat aan die stroomaf kant van groot poele maar nooit by die inloop van 'n groot poel nie. In mere en damme word hulle gelos in vlak water met goeie skuiling.

Die winterklimaat van Transvaal is ideaal vir die verspreiding van forelle in riviere want die riviere is nooit in vloed nie, die water is helder en die paaie is droog. Die resultate van een jaar se winterverspreiding was baie belowend. Vis wat in die winter van 1949 in die riviere ingevoer is as 4 duim vingerlinge het in April 1950 reeds die wetlike lengte van 10 duim bereik. In baie riviere kan hulle maklik uitgeken word, deurdat hulle kleiner was as jaaroud vis en groter as die kleintjies van die vorige winter.

Hierdie eksperiment beklemtoon die merkwaardige aanpassingsvermoë van die reënboogforel onder verskillende omstandighede, en dit het ook bewys dat beter resultate verkry kan word deur vingerlinge in die riviere in te voer as klein pasuitgebrooide forelle. Nietemin was die invoer van foreleiers slegs 'n tussentydse maatreël wat nodig was weens die tekort aan foreleiers. Tot dusver was ons gelukkig genoeg om heeltemal vry te wees van forelsiektes in Transvaal en vanweë die gevaar van die invoer van siektes word die invoer van foreleiers selfs met sertifikate van gesondheid, nie aanbeveel nie.

Die mees opvallende kenmerk van die ingevoerde eiers is die feitlik totale afwesigheid van gebreklike klein vissies. Vis wat van die eiers afkomstig is het ook kleintjies sonder gebrek gelewer. Mnr. D. F. Leney van die Surrey Trout Farm in Engeland is van mening dat verkeerde voeding en hoë temperature 'n belangrike rol speel by die produksie van gebreklike forelle. In Suid-Afrika waar betreklik hoë temperature algemeen voorkom verdien hierdie faktore spesiale aandag as mens eerstegraad foreleiers wil produseer.

A Vaalriver Yellowfish.

'n Vaalrivier geelvis.

THE VAAL RIVER YELLOWFISH

(Barbus aeneus)

by

A. A. v. J. GROENEWALD
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THE South African yellowfish belongs to the Cyprinidae family, which also includes other well-known warmwater fish like the mudfish (*Labeo*), the goldfish (*Carassius*) and the carp (*Cyprinus carpio*). The genus Barbus is widely distributed in Africa and Asia and in India. A well-known representative of this genus, the Indian Mahseer attains a length of 5 to 6 feet, weighs anything up to 90 pounds and is an excellent sporting fish.

The Vaal River yellowfish was first described by the traveller Burchell. Later the Australian, Dr. Holub, collected many specimens and described them under a different name. Dr. K. H. Barnard made a detailed study of the Barbus genera of the south-western region of the Cape Province, but otherwise the genus

DIE VAALRIVIER GEELVIS

(Barbus aeneus)

deur

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GEELVISSE word geklassifiseer onder die familie Cyprinidae. waartoe onder andere ook alombekende vissoorte soos goudvissies (*Carassius*) die moddervis (*Labeo*) en die karp (*Cyprinus carpio*) behoort. Die genus Barbus het 'n wye verspreiding en kom voor in Afrika en Asië. In Indië bereik 'n bekende verteenwoordiger van hierdie genus, die Mahseer, 'n lengte van 5 tot 6 voet, weeg enigiets tot 90 lb. en is 'n uitstekende sportvis.

Die Vaalrivier geelvis is vir die eerste maal deur die reisiger Burchell beskrywe, later het die Australiër, dr. Holub, baie eksemplare versamel en hulle onder 'n ander naam beskrywe. Dr. K. H. Barnard het 'n deeglike studie van die Barbus-genera van die suidwestelike gedeelte van die Kaapprovinsie gemaak, maar origens is die

Barbus (especially the many Transvaal forms) is poorly known, and the exact number of species occurring in South Africa is unknown.

A full-grown Vaal River yellowfish can easily be distinguished from other fresh-water fish by its brilliant yellow colour, its streamlined torpedo-like body shape, its deeply-forked tail fin, the large scales and small, toothless mouth. Behind the head there is a sharply rising nape and although the nape is already present in halfgrown specimens it is only fully developed in full-grown fish. Due to the enlarged condition of the belly the nape is more conspicuous in gravid females than in males. The proportions of the body vary considerably at different ages. In 3¾ inch specimens the length of the head is greater than the body depth. From a length of 8 inches the head-length is shorter than the depth of the body owing to the development of the nape. Vaal River yellowfish are known to reach a length of 2 feet and they sometimes weigh as much as 30 pounds. The length of a full-grown specimen is 3¼ to 4 times the depth of the body.

When a scale of Barbus aeneus is examined under a hand lens or low-power microscope many longitudinal lines or striae will be seen. 4 to 5 such striae are present when the scales are first formed and the number gradually increase to about 35 in the full-grown fish. There are 41 to 43 scales in the lateral line, 15 to 17 between the head and the anterior rays of the dorsal fin, and 15 to 17 around the caudal peduncle of the full-grown fish.

There are two barbels on each side of the head near the corners of the mouth. The posterior two are a little longer than the anterior two, they are 3/5ths to 1½ times the diameter of the eye and begin to develop when the little fish has a length of 4/5th inch. The anterior pair start developing after the fish has reached a length of about

genus Barbus (veral die talle Transvaalse soorte) swak bekend, en die juiste aantal species wat in Suid-Afrika voorkom is onbekend.

Die opvallendste kenmerke van 'n volwasse geelvis is sy pragtige geel kleur, die slank torpedo-vormige liggaam met 'n diep gevurkte stertvin, die groot skubbe en die klein, sagte, tandelose mond. Die volwasse Vaalrivier geelvis het 'n duidelike skof agter die kop, en alhoewel dit reeds by halfwasse eksemplare aanwesig is, kom dit egter eers by die volwasse vis tot volle ontwikkeling. By eierdraende wyfies is die skof as gevolg van die vergrote toestand van die buik, meer opvallend as by mannetjies. Die liggaamsverhoudings varieer aansienlik op die verskillende ouderdomme; tot op die 3¾ duim-stadium is die kop langer as wat die liggaam diep is. Op die 8 duim-stadium begin die skof ontwikkel en die koplengte word dan gevolglik kleiner as die liggaamsdiepte. Die Vaalrivier geelvis bereik 'n gewig van 30 pond en die lengte van 'n uitgegroeide eksemplaar is 3¾-4 maal die diepte van die liggaam.

Wanneer 'n skub van Barbus aeneus onder die mikroskoop beskou word, dan blyk dit dat daar 'n groot aantal strepies (ook genoem striae) min of meer parallel oor die lengte van die skub loop. Die skubbe word gevorm wanneer die vissie 1 duim lank is en op hierdie stadium is daar alreeds 4 tot 5 striae teenoor 35 van die volwasse vis. Die sylyn is volledig en by die volwasse Vaalrivier geelvis strek dit oor 41 tot 43 skubbe. Daar is 15 tot 17 skubbe voor die rugvin en ook 15 tot 17 rondom die anaalpedunkel, d.i. daardie gedeelte van die liggaam net voor die stertvin.

Aan weerskante van die kop is daar in die wyk van die mondhoeke twee paar voelers. Die agterste paar is 'n bietjie langer as die voorste, is 3/5 tot 1½ maal die deursnit van die oog en ontwikkel wanneer die vissie 4/5de duim lank is. Die voorste paar ontwikkel op die 1 duim-stadium. Die mond is sub-inferior geleë en die snoet

1 inch. The mouth is sub-inferior and the snout projects for a small distance beyond the mouth. In some genera of Barbus the lips are extraordinarily thickened and among anglers such specimens are known as "Rubber-lips". Barnard states that two varieties of Barbus capensis are found in the Olifants River near Clanwilliam—one form with thin, normal lips and another with "rubber lips". Except for the thickened lips these two forms are identical in all other respects and the "rubber lip" is by no means a separate species. J. Hora, as quoted by Dr. K. H. Barnard, is of opinion that the lips of the Indian Mahseer are thickened to form a kind of suction apparatus which enables the fish to attach itself to rocks in fast flowing streams. The opinion of Clanwilliam anglers that the "rubber lip" variety of the Clanwilliam yellowfish is usually found in the more rapid parts of the Olifants River seems to support this theory. The occurrence of "rubber lips" in the Barbus genus is at present investigated at this institute. Extensive netting in the Vaal River has never produced any "rubber lips" and the specimens which were brought from Vaaldam to the Provincial Fisheries Institute at Lydenburg were all of the thin-lipped variety. On the other hand "rubber lips" are more common among low-veld species.

Halfgrown and smaller specimens have irregular markings in the form of short, vertical crossbars on the upper part of the body. Small specimens also have a dark spot at the base of the tail fin. Vaal River yellowfish are silvery when young, but full-grown specimens are yellowish-green on the back and dorsal surface of the head, the cheeks and gill-covers are yellow, the sides of the body have a pale

staan effe voor die mond uit. By die Barbus-soorte van Afrika en Indië tree daar somtyds 'n eienaardige kenmerk in die vorm van verdikte lippe op. Sulke eksemplare word algemeen deur hengelaars as „rubberlippe" beskryf. In die Olifantsrivier by Clanwilliam kom daar twee variëteite van die Clanwilliam-geelvis (*Barbus capensis*) voor, nl., 'n vorm met dik, vlesige lippe en 'n tweede vorm met normale dun lippe. Daar kan egter geen aparte species op grond van hierdie verdikte lippe geskep word nie, want met uitsondering van die dik, vlesige lippe stem 'n „rubberlip" in alle opsigte met die gewone Clanwilliamgeelvis ooreen. Ter verklaring van hierdie buitensporige ontwikkeling van die lippe bestaan daar die volgende teorie. J. Hora, soos gekwoteer deur K. H. Barnard, meen dat die lippe by die mahseer van Indië verdikking ondergaan het om 'n suigapparaat te vorm waarmee die vis homself in vinnigvloeiende strome aan rotse kan vasanker. In ooreenstemming met hierdie hipotese skryf Barnard, is die Clanwilliam hengelaars van opinie dat die „rubberlip"-varieteit alleen in die vinnigvloeiende gedeeltes van die Olifantsrivier voorkom. Ten spyte van die feit dat die Vaalrivier al intensief genet is, is daar nooit „rubberlippe" gevind nie en die eksemplare, wat vanaf Vaaldam na die Provinsiale Visseryinstituut te Lydenburg gebring is, was almal van die dun-lip-varieteit. „Rubberlippe" kom egter baie algemeen onder die laeveld-spesies voor. Die voorkoms van „rubberlippe" by Barbus-genera word nou by hierdie Instituut ondersoek.

By halfwasse en kleiner eksemplare is daar onreëlmatige, donker kolle op die boonste gedeelte van die liggaam. Hierdie kolle kan selfs die geaardheid van kort, vertikale dwarsstrepe hê en aan die basis van die middelste vinstrale van die stertvin is daar 'n min of meer driehoekige kolletjie. Namate die vissie ouer word verdwyn die kolle en die jong vis het dan 'n silwer kleur. Volwasse eksemplare is groengeel op yellow colour and the belly is nearly white. The colour of a yellowfish is to a great extent determined by the nature of the water in which it is living. In the crystal clear water of Schoonspruit near Ventersdorp, yellowfish have a beautiful bright yellow colour. Living Vaal River specimens, which have been transferred from the discoloured water of Vaaldam to the clear water of the Provincial Fisheries Institute at Lydenburg developed a much brighter yellow colour.

The dorsal fin is usually a little nearer to the root of the tail than to the eye. Its posterior surface is slightly concave and the first four rays are developed into bony spines. The fourth ray is extraordinarily thickened to form a stout non-serrated spine. The last 8 or 9 rays of the dorsal fin are soft and branched. Gillchrist and Thompson give the number of branched rays as 8 but according to Dr. K. H. Barnard the number 9 is equally typical. In the Orange River near Goodhouse in the Cape, most specimens have 9 branched rays in the dorsal fin, whereas the number 8 is typical of yellowfish above the Aughrabies Falls. During development the ventral fins undergo a forward shift relative to the dorsal fin. Up to a body length of approximately 1¾ inches, the base of the ventral fin spine is situated below the fourth spine of the dorsal fin, but fish with a length of 4 inches or more has the ventral fin spine slightly in front of the first dorsal spine. (Barnard 1943.)

die rug en bokant van die kop, die wange het 'n lemoen-geel kleur, die sye 'n liggeel en die buik is feitlik wit. Die kleur van 'n geelvis word tot 'n groot mate deur die geaardheid van die water bepaal. In die kristalhelder water van die oog van Schoonspruit naby Ventersdorp het die geelvisse 'n pragtige, heldergeel kleur. Lewendige Vaalrivier geelvisse, wat uit die vaal water van Vaaldam na die helder water van die Visseryinstituut oorgeplaas is, het 'n meer helder geel kleur aangeneem.

Die rugvin is gewoonlik 'n bietjie nader aan die wortel van die stertvin as aan die oog. Sy agterrand is effe konkaaf en die voorste vier vinstrale is stywe, benige stekels. Dit is veral waar van die 4de vinstraal, wat enorm verdik is om 'n stewige, nie-gekartelde stekel te vorm. Agter die stekels is daar 8 of 9 sagte, vertakte vinstrale. Alhoewel Gillchrist en Thompson die getal vertakte vinstrale as 8 aangee, beskou Dr. K. H. Barnard 9 as 'n ewe tipiese getal. In die Oranjerivier in die omgewing van Goodhouse het die meeste eksemplare 9 vertakte vinstrale in die rugvin, terwyl die getal 8 weer oorheersend is by geelvisse bokant die Aughrabies-valle (Barnard 1943).

Daar is 'n prominente anale vin met 3 harde en 5 vertakte sagte vinstrale. Gedurende die groeiperiode ondergaan die anale vin 'n baie interessante verandering. By jong en halfwasse visse is die agterrand van die vin vertikaal as die vin in so'n posisie gehou word dat die laaste vertakte vinstraal horisontaal is. By volwasse eksemplare is die agterrand effe konveks en obliek. Die eerste vertakte vinstraal is altyd langer as die laaste en as die vin platgedruk word, dan strek dit tot 'n punt ver agter die laaste vertakte vinstraal. By jong en halfwasse eksemplare reik die 1ste vertakte vinstraal tot 'n punt ongeveer halfpad tussen die basis van die laaste vertakte vinstraal en die basisse van die onderste strale van die stertvin. By die volwasse vis reik dit byna tot aan die basisse van die stertvin se onderste strale. Namate die vis groei verander die relatiewe posisie van

Very little was known about the habits of the Vaal River yellowfish and 25 specimens were caught at Vaaldam, where they were kept in small dams for 2½ years. They never bred during this period and were transferred to the Provincial Fisheries Institute at the end of 1949, where they were kept under constant observation. They were very seldom seen during winter, but in September they started swimming around near the surface of the water. At this stage a gravel bank (consisting of 1½ inch pieces) was prepared at the inlet of the spawning pond, in one corner willow and cypress branches were fastened under water and the pond had a strong current of water flowing through it. When the water temperature rose above 65° F. the fish started moving in a school, and during daytime could be seen swimming around the inlet, where certain parts of the gravel bank were cleaned with fanning movements of the tail fins. Seven days later they lost all interest in the gravel bank and were then mostly swimming about in pairs. Although they were often observed while cleaning gravel-bottomed depressions at the sides of the pond at a depth of about 2¼ feet, the actual spawning was never seen. On the 20th of October the first fry were seen swimming in the shallow water around the sides of the pond. Only the eyes and air-bladder were dark-coloured and as they were only 2/5ths of an inch long at the time, it was exceptionally difficult to see them.

die buikvinne met betrekking tot die rugvin. Op 1¾ duim-lengte is die basisse van die twee buikvinstekels vertikaal onder die 4de stekel van die rugvin. Vanaf die 4 duim-stadium is die basisse van die twee buikvinstekels egter 'n klein endjie voor die basis van die 1ste stekel van die rugvin. (K. H. Barnard.)

Ten spyte van die feit dat die geelvis bekend is as 'n uitstekende sportvis, is daar baie min omtrent sy gewoontes bekend en tot onlangs was dit onseker of hierdie vissoort in klein gronddamme kan aanteel. Met die doel om hierdie moontlikheid te ondersoek is 25 Vaalrivier geelvisse in Vaaldam gevang en daar in klein gronddammetjies gehou. Alhoewel hulle vir 2½ jaar in hierdie damme gehou is, het hulle nooit aangeteel nie en teen die einde van 1949 is hulle oorgebring na die Visseryinstituut. Gedurende die wintermaande was hulle feitlik nooit te sien nie, maar toe die watertemperatuur gedurende September geleidelik gestyg het, het hulle op warm dae so naby aan die oppervlakte van die water rondgeswem dat hulle rugvinne somtyds ui gesteek het. Op hierdie stadium is die broeidam in gereedheid gebring: by die inloop was daar 'n gruisbedding bestaande uit klippe met 'n gemiddelde deursnit van 1½ duim, in die een hoek is wilger- en sipres-takke onder die water vasgemaak en daar het 'n sterk stroom water deur die dam geloop. Nadat die watertemperatuur vir 'n paar agtereenvolgende dae bokant 65° F. gestyg het, het hulle op die 6de Oktober aktief geword en rusteloos in 'n skool rondbeweeg. Bedags het hulle by die inloop, bokant die gruisbank rondgedraai en die gruisbank op 'n paar plekke skoongemaak. Vanaf die 13de is die visse nie meer by die gruisbank gesien nie, maar het meestal in pare rondom die kant en by die wilgertakke rondgeswem. Dikwels is hulle waargeneem waar hulle besig was om ui hollings in die damwal skoon te maak. Die plekke wat hulle uitgekies het, het fyn klipgruis bevat en nadat dit skoongemaak is, was daar 'n vaste bodem van fyn

At first their food consisted solely of small crustaceans like water-fleas (*Bosmina sp.*) Ostracods (*Cypris*) and Copepods (*Cyclops*), but by the time they were 1½ to 2 inches long they also started feeding on mosquito larvae. From the 2¾ inch stage the amount of small crustaceans gradually diminished and was to a great extent substituted with plant material, mosquito larvae, unicellular and filamentous algae.

On the 14th November the parent fish were transferred to another dam and in contrast to their condition at the beginning of September the males now showed the following characters: The head was covered with minute white pimples most densely concentrated below the nostrils as well as anterior and dorsal to the eye. Posteriorly they spread backwards in a narrow and scattered row up to the base of the first dorsal fin spine. Something exceptional was observed in the anal fin: On either side of the posterior vein of every branched ray there was a single row of minute, horny, conical teeth and in one row 13 were counted, in another 10.

It was now known on what kind of bottom the female yellowfish preferred to lay their eggs and heaps of gravel (approximately ¼ to ¾ of an inch diameter), mixed with sand, were provided in the new pond at a depth of 18 inches. The fish were seen in pairs near the gravel banks, but although places about the size of a plate were slightly hollowed out and

gruis en grond. Die lê en die bevrugting van die eiers is egter nooit waargeneem nie. Op die 20ste Oktober is die eerste klein geelvissies gesien waar hulle orals langs die kante rondgeswem het. Dit was besonder moeilik om hulle raak te sien, want al wat swart vertoon het was die swemblaas en die twee ogies, verder was hulle feitlik deurskynend. Toe hulle vir die eerste maal waargeneem is, was hulle gemiddelde lengte 2/5de duim en hulle voedsel het uitsluitlik uit laere skaaldiertjies bestaan, waarvan watervlooie (*Bosmina*), Ostrakode (*Cypris*) en die sg. „een-oog ” (*Cyclops*) die belangrikste is. By vissies met 'n lengte van 1½ tot 2 duim verskyn daar vir die eerste maal muskietlarwes in die maaginhoud. Vanaf die 2½ duim-stadium verminder die hoeveelheid skaaldiertjies en inseklarwes geleidelik en op die 3¼ duim-stadium bestaan die maaginhoud meesal uit plantmateriaal, censellige diertjies, alge en diatome.

Op die 14de November is die broeivisse na 'n ander dam oorgeplaas en in teëstelling met hulle toestand van die begin van September het die mannetjies nou die volgende sekondêre geslags kenmerke vertoon: Die kop was bedek met klein wit knoppies, wat onderkant die neus-openings en aan die voor en bokante van die oë die digste gekonsentreerd was. Daar was baie min knoppies op die kieudeksels, maar na agter het die knoppies in 'n smal en yl streep tot aan die basis van die 1ste stekel van die rugvin gestrek. Ook is daar iets buitengewoons omtrent die anale vin opgemerk. Aan weerskante van die distale helfte van elke vertakte vinstraal was daar 'n enkele ry klein koniese horingtandjies. In een ry is 13 getel en in 'n ander 10.

Omdat dit nou bekend was watter soort bodem die geelviswyfie verkies om haar eiers op te lê is hope fyn gruis (Ongeveer ¼ tot 1½ duim stukkies) gemeng met growwe sand langs die kante van die nuwe dam op 'n diepte van ongeveer 20 duim aangethoroughly cleaned so that there were no silt and fine sand on the bottom, the actual mating was never observed. On the 12th of December it was discovered that the fish had actually spawned a second time, and thousands of fry of different sizes were seen around the sides of the pond. The fry gathered into a large school and when frightened they moved away in a zig-zag line sometimes 30 feet long. Six weeks after the first fry were seen in this pond, the fish again started cleaning places with a diameter of 10 to 12 inches around the sides of the pond at a depth of two to four feet: most of these places had a hard bottom without any gravel and were given up in favour of a gravel bank, where the ground was loose and contained many stones with a diameter of 1 to 1½ inches, mixed with sand and gravel. This nest had a diameter of 11 inches, was hollowed out to a depth of 2 inches and the bottom consisted solely of stones (± 1 inch diameter) and fine gravel. On one side of the nest a trough-like extension was made. This extention of the original nest had a bottom of sand and gravel and was in some places four inches deep. The fish used their mouths and snouts to loosen the ground in the bottom of the nest and trough. The fine sand and gravel in the loosened bottom was then easily cleared away with the tail fin, and the fish could often be seen

bring. Op die 12de Desember is ontdek dat die geelvisse vir 'n tweede keer gebroei het en etlike duisende kleintjies van verskillende groottes het in die vlakwater rondom die kant rondgeswem. Sodra hulle aktief begin rondswem versamel die kleintjies in 'n groot skool. Die kleintjies het van tyd tot tyd 'n voorliefde vir 'n bepaalde plek in 'n dam getoon en wanneer hulle skrikgemaak word, neem 'n aantal die voortou en die skool beweeg dan al kronkelend in 'n lang streep, soms 30 voet lank, na 'n ander deel van die dam.

In hierdie dam kon duidelik gesien word hoedat die visse met vinnige, swaaibewegings van die stert plekke, omtrent so groot soos 'n bord, op die gruisbanke skoonmaak. Op hierdie plekke was die bodem slegs baie effens uitgehol, alle fyn sand en afsaksel is weggeveeg en die gruisklippies was heeltemal skoon. Alhoewel die geelvisse in pare naby die gruisbank opgemerk is, is die werklike paring egter nooit waargeneem nie. Ongeveer ses weke nadat die eerste kleintjies in hierdie dam gesien is, is opgemerk dat die geelvisse weer begin om orals rondom die kant op 'n diepte van 2 tot 4 voet plekke met 'n deursnit van 10 tot 12 duim en in harde vaste bodem skoon te maak. Die meeste van hierdie toetsplekke was sonder gruis, maar die visse het uiteindelik voorkeur gegee aan 'n plek, waar die grond los was en baie klippe met 'n deursnit van 1 tot 1½ duim, gemeng met fyner gruisklippies bevat het. Hierdie kol het 'n deursnit van 11 duim gehad, dit is intensief skoongemaak en tot 'n diepte van 2 duim uitgehol sodat die bodem uitsluitlik uit klippe (met 1 dm. gemiddelde deursnit) en fyn gruisklippies bestaan het. Later is die nes vir omtrent 3½ voet verleng. Hierdie verlenging het die geaardheid van 'n vlak sloot gehad, was op sommige plekke 4 duim diep en die bodem het vir sy grootste gedeelte bestaan uit fyn gruis en grond. By die maak van die verlenging en tot 'n mindere mate ook van die nes, het lying on their sides in the trough fanning it with strong movements of the tail fin.

A second nest with the same diameter, depth and type of bottom, was made beside the first nest and the whole area was continuously kept clean of silt. This was the only place to be cleaned at the time and sometimes as much as 18 fish were seen in the vicinity of this gravel bank. It appears as though the females are going to use this area as a communal nest but unfortunately no definite information is available at the time of writing. Spawning as well as the greatest part of the nest-making activity undoubtedly takes place very early in the morning.

The discovery that the Vaal River yellowfish will spawn successfully on gravel patches in the standing water of small dams is certainly very important from the fisheries point of view: it was proved that yellowfish can easily be cultured, and fingerlings are now available in great numbers for stocking rivers and dams where they do not occur.

It is fitting to begin the study of the indigenous fish of Transvaal with an investigation of this famous fighter of the Vaal River and on completion it will be an important contribution to our knowledge of the Transvaal fauna.

die visse die grond op die bodem van die nes met hulle bekke losgevroetel en daarna die fyn gruis en sand met die stertvin weggevee. Die nes, die verlenging sowel as die area rondom die nes is gedurig skoongehou en dikwels kon 'n vis gesien word waar dit op sy sy in die verlenging lê en die nes met ritmiese swaaie van die stertvin skoonmaak. Nadat die verlenging voltooi was, is daar aan die teenoorgestelde kant van die oorspronklike nes, 'n 2de nes gemaak met dieselfde diepte, deursnit en bodem as die oorspronklike nes, en aangesien hierdie die enigste plek in die dam is, wat skoongemaak is en gedurig skoongehou word skyn dit asof hierdie area as 'n gemeenskaplike broeiplek vir die wyfies gaan dien, want soms kan daar soveel as 18 visse bokant hierdie kol gesien word. By die skrywe van hierdie artikel is daar ongelukkig nog geen verdere informasie beskikbaar nie, maar dit wil voorkom asof die lê van die eiers in die belangrikste deel van die nesmakery baie vroeg in die oggend geskied.

Hierdie ontdekking dat die Vaalrivier geelvis, wel op gruisbeddings in die stilstaande water van klein damme sal aanteel is uit die vissery-oogpunt beskou, van groot belang, want nie alleen is daar bewys dat die Vaalrivier geelvis maklik geteel kan word nie, maar dit beteken ook dat geelvis in die toekoms in groot getalle beskikbaar sal wees vir loslating in plaasdamme en in geskikte waters, waar hulle nie voorkom nie.

Dit is paslik om die studie van die Transvaalse inheemse vis in te lei met die bestudering van hierdie baasvegter van die Vaalrivier en wanneer dit voltooi is, sal dit 'n belangrike bydrae tot ons kennis van die Transvaalse fauna wees.

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THE DISCOVERY OF THE GIRAFFE IN SOUTH AFRICA

by
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WHEN Jan van Riebeeck and his settlers took possession of the Cape in the year 1652, they came in o contact with a flora and fauna that was totally different from what they knew from the Netherlands and other parts of Europe. As they went further afield, new kinds of plants and animals were constantly met with.

It was natural that the settlers soon began to explore the country that was to be their new home. At first these exploring parties did not venture far afield. Their objects were generally to become acquainted with the country's geography, with the native tribes by which it was inhabited and with its natural resources, and also to obtain cattle by barter for victualling ships that called at the Cape.(6) But soon more ambitious expeditions set out, particularly along the west coast of South Africa to the territory of the Namaquas. Between the years 1660 and 1664 the following six expeditions were made [(3), p. 5]: —

1. Expedition of Jan Danckaert in search of Monomatapa—12th November, 1660, to 20th January, 1661.
2. First journey of Pieter Cruijthoff—30th January, 1661, to 11th March, 1661.
3. Journey of Pieter van Meerhoff—21st March, 1661, to 23rd April, 1661.
4. Journey of Pieter Everaert—15th November, 1661, to 13th February, 1662.
5. Second journey of Pieter Cruijthoff—21st October, 1662, to 1st February, 1663.
6. Journey of Jonas de la Guerre—11th October, 1663, to 22nd January, 1664.

DIE ONTDEKKING VAN DIE KAMEELPERD IN SUID-AFRIKA

deur
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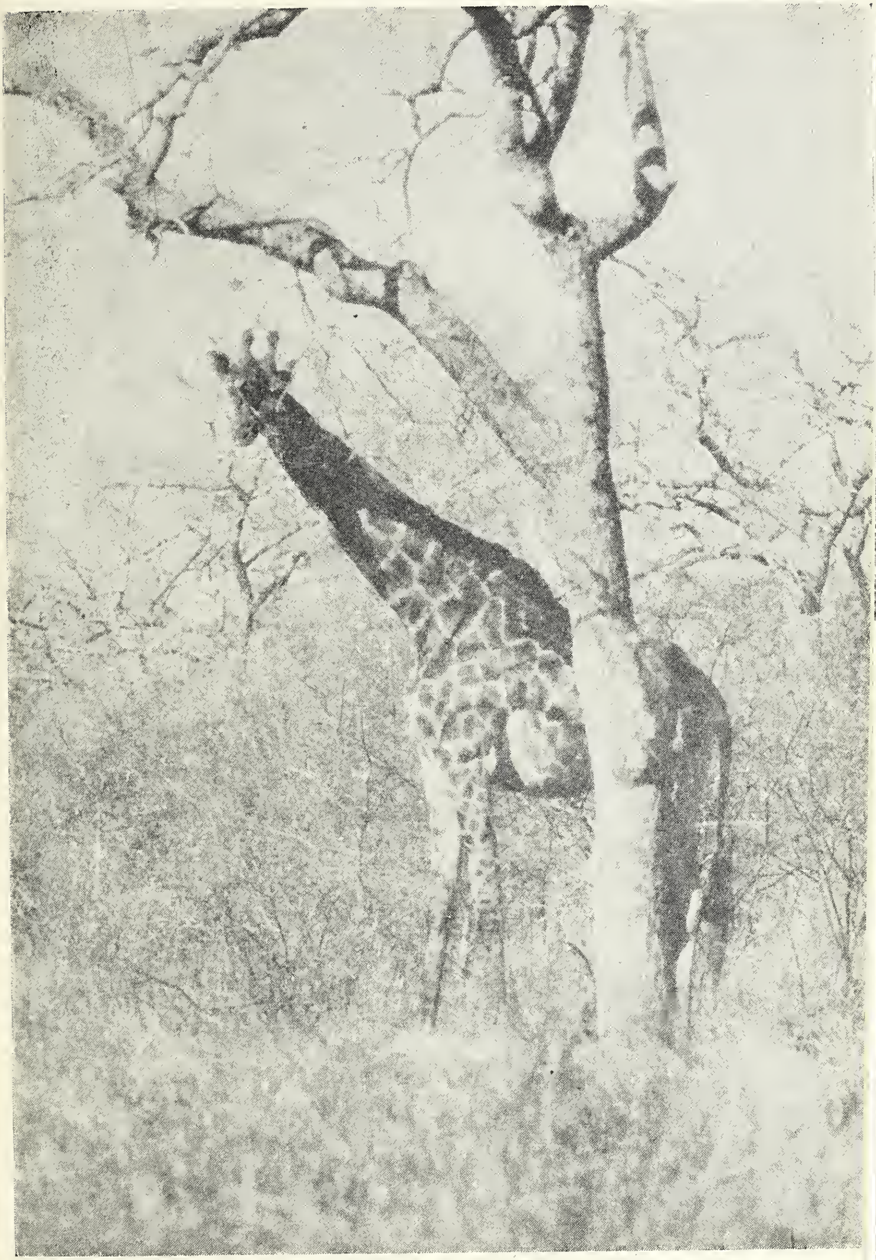
TOE Jan van Riebeeck en sy nedersetters in 1652 besit geneem het van die Kaap, het hulle in verbinding gekom met 'n flora en fauna wat heeltemal verskillend was van wat hulle in die Nederlande en ander dele van Europa geken het. Namate hulle verder binnelands beweeg het, het hulle gedurig met nuwe soorte plante en diere in aanraking gekom.

Dit was natuurlik dat die nedersetters vroeg begin het om die nuwe land wat hulle toekomstige tuiste moes wees te verken. In die begin het hierdie verkenningspartye dit nie ver binnelands gewaag nie. Hulle doel was in die algemeen om bekend te raak met die land se aardrykskunde, met die naturelle stamme wat dit bewoon het en met die natuurlike bronne en ook om vee te bekom deur ruilhandel om skepe wat by die Kaap aandoen met voedsel te voorsien.(6) Dit was egter nie lank nie of meer ambisieuse ekspedisies het uitgegaan, veral langs die weskus van Suid-Afrika na die gebied van die Namaquas. Tussen die jare 1660 en 1664 is die volgende ekspedisies onderneem [(3), p. 5]: —

1. Ekspedisie van Jan Danckaert op soek na Monomatapa—12 November 1660 tot 20 Januarie 1661.
2. Eerste reis van Pieter Cruijthoff—30 Januarie 1661 tot 11 Maart 1661.
3. Reis van Pieter van Meerhoff—21 Maart 1661 tot 23 April 1661.
4. Reis van Pieter Everaert—15 November 1661 tot 13 Februarie 1662.
5. Tweede reis van Pieter Cruijthoff—21 Oktober 1662 tot 1 Februarie 1663.
6. Reis van Jonas de la Guerre—11 Oktober 1663 tot 22 Januarie 1664.



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Giraffe (Eastern Transvaal).
Kameelperd (Oos-Transvaal).

[Photo/Foto: W. F. Scha

It was during the course of de la Guerre's expedition that the Giraffe (*Giraffa camelopardalis*) was first seen in what is now the Union of South Africa. This expedition's journal was kept by Pieter van Meerhoff, and the following extract is from Godée Molsbergen's account [(2), p. 118]:—

> „ Bergop, bergaf ging de tocht tot de plek waar Cruijthoff het jaar tevoren Namaqua aantrof. , Hier beginnen wij vreemt gevogelte en bosschagie te sien', en op 28 November (d.w.s. van die jaar 1663) werden die eerste giraffen gezien: , in 't marcheeren is van ons twee camelen gesien *welcke beesten noyt voor dezen* (italics by the writer, R.B.) is vernomen waer door wij presumeerden dat wij niet verre van de Revier Vigita Magna waren, wandt ick had voordesen wel hooren seggen van de Namacquas als dat daer ontrent de revier sulcke beesten sich onthiel' ".

According to Mossop [(4), p. viii, (3), p. 13] the two giraffes mentioned by van Meerhoff were seen near the *Spoeg River*, that is to say about 120 miles *south* of the Orange River.

Sclater [(5), p. 263] makes the following statement: "The existence of the giraffe in the southern part of Africa was *first made known* by the expedition sent by the Governor Tulbagh, under Brink and Hop, to Namaqualand in 1761; notice of a rude sketch made by them will be found in the 13th vol. of Buffon". He also states: "There does not seem to be any evidence of the occurrence of this animal *south* (italics by the writer, R.B.) of the Orange River; Bryden, who discusses the matter, can find no better argument than the bushmen pictures in some caves near Graaff Reinet, but there is no doubt that bushmen illustrated animals seen during their devious wanderings over the country, and by no means confined themselves to those in the immediate neighbourhood".

Dit was gedurende die loop van de la Guerre se ekspedisie dat die Kameelperd (*Giraffa camelopardalis*) vir die eerste keer gesien is in wat nou bekend is as die Unie van Suid-Afrika. Die dagboek was gehou deur Pieter van Meerhoff, en die volgende is 'n uittreksel uit die verslag van Godée Molsbergen [(2), p. 118]:—

> „ Bergop, bergaf ging de tocht tot de plek waar Cruijthoff het jaar tevoren Namaqua aantrof. , Hier beginnen wij vreemt gevogelte en bosschagie te sien' en op 28 November (d.w.s. van die jaar 1663) werden die eerste giraffen gezien: , in 't marcheeren is van ons twee camelen gezien *welcke beesten noyt voor desen* (kursief deur die skrywer, R.B.) is vernomen waer door wij presumeerden dat wij niet verre van die Revier Vigita Magna waren, wandt ick had voordesen wel hooren zeggen van die Namacquas als dat daer ontrent de revier sulcke beesten sich onthiel' ".

Volgens Mossop [(1), p. viii, (3), p. 13] is die twee kameelperde wat deur Meerhoff genoem word, naby die *Spoegrivier* gesien, dit wil sê omtrent 120 myl *suid* van die Oranjerivier.

Sclater [(5), p. 263] verklaar as volg: „The existence of the giraffe in the southern part of Africa was *first made known* by the expedition sent by the Governor Tulbagh, under Brink and Hop, to Namaqualand in 1761; notice of a rude sketch made by them will be found in tht 13th vol. of Buffon." Hy verklaar ook: „There does not seem to be any evidence of the occurrence of this animal *south* (kursief deur skrywer, R.B.) of the Orange River; Bryden, who discusses the matter, can find no better argument than the bushmen pictures in some caves near Graaff Reinet, but there is no doubt that bushmen illustrated animals seen during their devious wanderings over the country, and by no means confined themselves to those of the immediate neighbourhood".

Brink and Hop's account of the finding of the Giraffe is as follows [(4), p. 33]:—

“ Monday, 5th October, 1761. We proceeded on, still along the river (i.e. the Leeuwen River), and then camped at the ‘ warme bad ’. This is an ever flowing spring of water, temperately warm, and thus always suitable to bathe in. The spring lies about two hundred paces from the east bank of the river on a low and stony rise. It bubbles up like boiling water and has a somewhat briny taste, not however markedly strong so it is not unpleasant to drink. We found the soil here to be fallow and the salt beside the water lay dry for the depth of a finger. Here the first giraffes were observed by us; one of these, a female was killed and the young one with it captured. Concerning the appearance of the one killed, we found the body to resemble most that of the cow, although head and neck were like that of the horse. The height from hoof to head was 17 feet, the proportion of body length to height was as one to two and a half. Moreover on account of this shortness of body in comparison with its other members, and because of its extraordinary movements, it is unthinkable that this animal can be employed for any useful purpose. For the rest, it is white in colour along neck and fore parts of the body, with light-brown checkered patches and diamond-shaped though more darkly brown patches on its hinder parts. On the forehead are two horns about a foot in length; these project forward and are en-

Brink en Hop se verslag van die vonds van die kameelperd is as volg [(1), p. 33]:—

„ Maandag den 5 October (1761): Marcheerden wy nog al langs het rivier (d.w.s. die Leeuwenrivier), quamen vervolgens te campeeren, aen het warme bad, sijnde een altijds loopende fonteijn, met water van getemperde warmte, en dus altoos bequaam om sig daar in te baden; leggende circa 200 treeden aan de Oost Syde van 't Rivier, op een kleijne klipagtige heuvel; hetselve borrelt als ziedend water op, en heeft eenigsints een brakke smaak, hetgeen egter maar seer wijnig, en dus niet onaangenaam om te drinken is, wy bevonden de grond hier rondsom brak te zijn, en het zout aan de kanten van dit water, een vinger hoog opgedroogd leggen.

Ook zijn hieromstreex door ons de Eerste kameleopardali gesien, alsmeede een daarvan, weesende een wijfie, gedood, en 't by zig hebbende jonge dier gevangen, be reffende de gedaante van 't gedoode beest, bevonden wy 't Lijf naar een koebeest; dog de hals en kop 't naast naar een paard te sweemen, en was de hoogte van de voorklaauwen, tot op de kop 17 voeten; Sijnde de lengte van 't lighaam geproportioneerd teegens de hoogte, als een teegens Twee en een half; en voorts weegens de kortheijd van 't Lijf, teegens d'andere leeden, in desselfs wonderlyke beweeging, niet te denken, dat dit beest tot enigen dienst gebruijkt kan worden; voor 't overige is dit dier van couleur wit, langs de hals en van vooren aan het Lijf, met ligt bruijne plekken, als een ruijt gevlakt, op het agterlijf op gelyke wyze, dog iets bruijnder geteekent; voor den kop heeft hetselve Twee hoorens, byna een voet lang, dewelke regt uyt staan, en met een haarige huid overtrocken zijn, desselfs voedsel soekt het meerendeels aan de hooge roode houtboomen (d.w.s. *Acacia haematoxylon* (1), p. 139]; doch iets van die

cased in hairy hide. Food is mostly sought on the tall Red-wood trees that is *Acacia haematoxylon*. See (¹) p. 139] yet they can graze on level ground, although on account of the tall forepart of the body they must go on their knees (it is now known, of course, that the animal straddles the fore-limbs and then bends the long neck down to the ground). We got Lat. 28.5 here, Long. 37.41 ".

The " warme bad " referred to by Brink and Hop is the present Warmbad in South-West Africa [(⁴), p. 33] and is situated about 25 miles *north* of the Orange River.

It is clear, therefore, that the Giraffe's presence in what is now the North-west Cape Province was recorded as far back as the 28th November, 1663, or less than twelve years after van Riebeeck reached the Cape on the 7th April, 1652, and very nearly 98 years *before* Brink and Hop came across the animal about 25 miles *north* of the Orange River in the present territory of South-West Africa. De la Guerre has shown that the Giraffe formerly occurred *south* of the Orange River in Namaqualand.

gelyke grond willende opnemen, Soo moet het, wegens desselfs hoog voorlijf op de kniën gaan leggen. (Vandag weet ons natuurlik dat die kameelperd sy voorpote wyd uitmekaar sprei en dan die lang nek na onder toe buig.)

Wy bevinden alhier de breete 28 gr. 5 min., lengte 37 gr. 41 min. te zijn."

Die „ warme bad " waarna Brink en Hop verwys, is die huidige Warmbad in Suidwes-Afrika [(⁴), p. 33] en dit is geleë ongeveer 25 myl noord van die Oranjerivier.

Dit is duidelik dus dat die teenwoordigheid van die kameelperd in die huidige Noordwestelike Kaapprovinsie reeds aangeteken is sover terug as die 28ste November 1663, of minder as 12 jaar nadat van Riebeeck die Kaap bereik het op 7 April 1652, en byna 98 jaar *voordat* Brink en Hop die dier teëgekom het om rent 25 myl noord van die Oranjerivier in die huidige gebied van Suidwes-Afrika. De la Guerre het gewys dat die kameelperd vroeër *ten suide* van die Oranjerivier in Namakwaland voorgekom het.

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NOTE ON A BLIND MIRROR CARP

(Cyprinus carpio)

by

V. FITZSIMONS, D.Sc.

ON the 22nd October, 1950, a well-conditioned Mirror Carp (*Cyprinus carpio*), weighing 20½ lb., was caught with mealie meal bait on rod and line, by a native in the Vaal River, about 14 miles from Potchefstroom.

The head was removed and given to Mr. G. E. Shellard (President of the Mooi Piscatorial Society, Potchefstroom) who, realising that no functional eyes were present, passed it on to Mr. W. Saltmarsh for submission to a competent authority for closer study.

AANTEKENINGE OOR 'N BLINDE SPIEËL-KARP

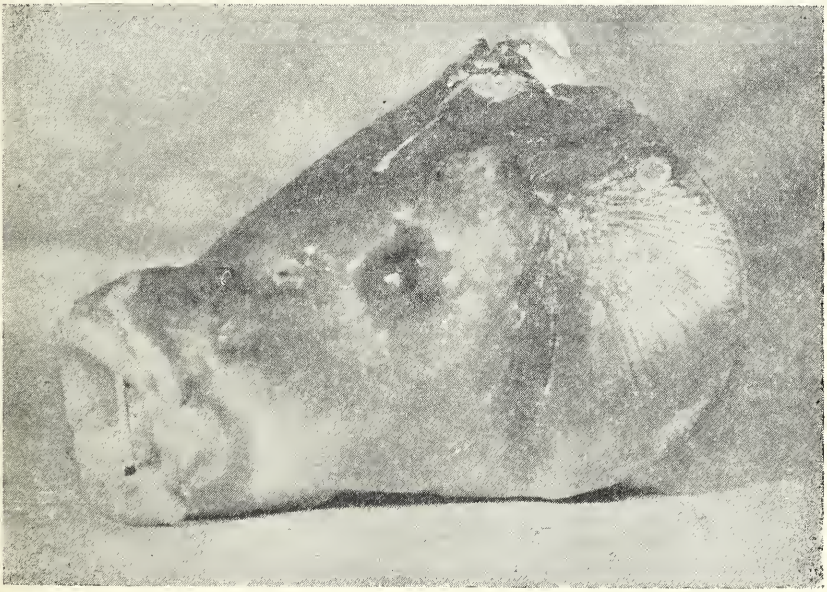
(Cyprinus carpio)

deur

V. FITZSIMONS, D.Sc.

OP 22 Oktober 1950, is 'n Spieël-Karp (*Cyprinus carpio*) van 20½ lb. in goeie kondisie deur 'n inboorling gevang met 'n hoek en lyn en met mieliemeel as lokaas in die Vaalrivier ongeveer 14 myl van Potchefstroom af.

Die kop is verwyder en aan mnr. G. E. Shellard (President van die Mooi-Hengelunie, Potchefstroom), gegee. Hy het opgemerk dat die vis geen funksionele oë gehad het nie en het dit toe weer aan mnr. W. Saltmarsh oorhandig vir verdere ondersoek deur 'n bekwame deskundige.



Head of Blind Mirror Carp.

Kop van Blinde Spieël-karp.

Mr. Saltmarsh delivered the specimen to the Transvaal Museum, where a careful dissection was made with the following results: —

> In neither eye-socket was there any sign of an eye, and even the optic nerve and eye muscles were found to have completely atrophied. The sockets were filled only with coarse skin tissue and were indicated externally merely by skin-covered hollows (see accompanying illustration).

It is therefore obvious that the eyes were lost at a very early stage in life, perhaps by accident, , but more probably by a disease. In spite of this handicap, however, the fish in question apparently not only survived, but reached well-conditioned maturity. This is of considerable interest, showing as it does that, at least in the Carp, the possession of eyes is by no means necessary for survival, and further that some other sense would seem to be of greater importance in the finding of food.

Mnr. Saltmarsh het dan toe ook die vis na die Transvaal-Museum gebring alwaar dit noukeurig ontleed is met die volgende resultaat: —

> In nie een van die twee oogkaste was daar 'n teken van 'n oog te sien nie, en selfs die oogsenuwees en oogspiere het heeltemal verdwyn. Die kaste was slegs met growwe velweefsel gevul en kan uiterlik net waargeneem word as 'n velbedekte holte (sien bygaande illustrasie).

Dit is dus duidelik dat die oë gedurende 'n vroeë stadium in die vis se lewe hulle funksie heeltemal verloor het, heelwaarskynlik per ongeluk, maar hoogwaarskynlik deur siekte.

Ondanks hierdie tekortkoming, egter, het hierdie vis nie slegs behoue gebly nie maar tot volle rypheid gekom. Dit is van aansienlike belang daar dit duidelik bewys dat in die geval van die Karp altans die besit van oë gladnie noodsaaklik is vir sy voortbestaan nie en voorts dat dit skyn asof 'n ander sintuig van groter belang is om kos mee te vind.

BOTRYDIUM

(Wallroth)

by

W. K. KETTLITZ

Acting Conservator of Fauna and Flora

BOTRYDIUM is a terrestrial freshwater, green alga, the areal portion is more or less globose (in direct sun) and spherical or pearshaped (in shade). This alga has an average length of 1-2 m.m. The vesicular or thallus above ground has an average diameter of ± 1 m.m. The portion underground (rhizoids) is colourless and branched.

The thallus contains nuclei and also chromatophores, giving it a green colour. Some species have a coating of calsium carbonate thus having a rather brittle surface structure—pyrenoids are present in the chromatophores.

The rhizoids contain cytoplasm without chromatophores. Nuclei are scattered in the transparant cytoplasm, which continues through to the thallus.

Botrydium grows on drying mud or sludge and it seems that this mud or sludge must be very fertile before the young plant germinates.

Botrydium is incapable of vegetative reproduction and reproduction therefore takes place in the following ways: —

(1) When the algae became submerged, the cytoplasm in the thallus is divided, to form zoospores. Each zoospore has a single nucleus and two cilia of uneven lengths, for locomotion. It seems that the wall of the thallus becomes gelatinous and the zoospores escape through this soft wall. After fusion of pairs of zoospores, a new plant developes from the zygote, in favourable conditions.

BOTRYDIUM

(Wallroth)

deur

W. K. KETTLITZ

Waarnemende Konservator van Fauna en Flora

BOTRYDIUM is 'n eensellige, varswater groenalg. Die gedeelte wat bogrond voorkom is bolvormig (in ope sonlig) of sfeervormig of peervormig (in skadu gedeeltes). Die plant is gemiddeld tussen een en twee millimeters groot, met die bogrondse deel of thallus, omtrent een milimeter in deursnee.

Die gedeelte ondergrond, of die rhizoied, is veelvoudig vertakt.

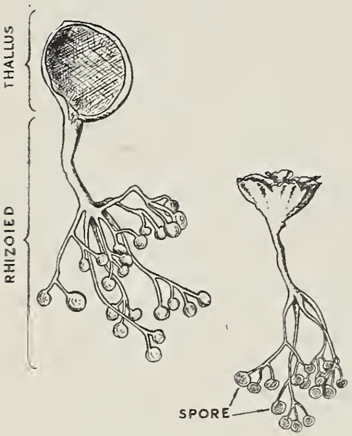
Die thallus bevat baie chromatophore wat dit die groen kleur gee, asook baie nucleïi en is bedek met 'n laag kalsium karbonaat in sommige species, wat die oppervlakte 'n effens bros struktuur gee. In die chromatophore is daar pyrenoiedes sigbaar.

Die rhizoiede bevat cytoplasma sonder chromatophore, sodat dit helder deursigtig is, met menigte nucleïi versprei in die cytoplasma. Die protoplasma in die thallus en die rhizoiede is aaneenlopend.

Botrydium groei op droogwordende modder of slik en dit skyn asof die modder of slik baie vrugbaar moet wees voordat die plantjie ontkiem.

Daar is geen vegetatiewe voortplanting nie en voortplanting geskied dus op die volgende maniere: —

(1) As die plante oorvloei word of onder water kom, dan word daar zoöspore gevorm uit die protoplasma in die thallus. Elke zoöspoor het 'n enkele nucleus met twee cilia, waarvan die een langer is as die ander een, en waarmee die zoöspoor dan kan beweeg in water. Dit blyk dat die wand van die thallus gelatienagtig word en dat die zoöspore dan hierdeur vrygelaat word. Na die samesmelting van die zoöspore, ontwikkel daar 'n nuwe plant uit die zygoot.



Batrydium tuberosum

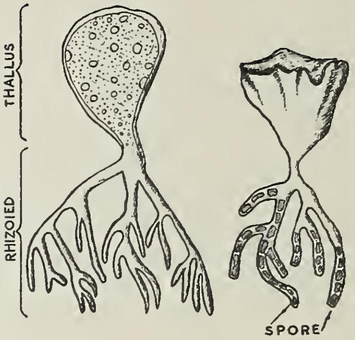
(2) When the algae are exposed to drought, the formation of aplanospores take place. The cytoplasm is divided into several small spores with a tough outer wall and without cilia. In other cases the cytoplasm of the thallus migrates to the rhidzoid, where it is divided into several spores which are strung in the branches of the rhidzoid like beads. These spores can develop into new plants directly.

(3) All the protoplasm in the thallus can contract into a thick walled akinete, which is very tough and will stand long drought periods. When favourable conditions occur this akinete will develope into a new plant.

There are four important species of Botrydium: —

(*a*) *B. wallrothii:* With a thick rough outer wall, containing calsium carbonate.

(*b*) *B. granulatum*: With a slightly larger thallus and a thin outer wall of calsium carbonate.



Batrydium granulatum

(2) As die plant onderhewig is aan droogte dan word aplanospore gevorm. Die cytoplasma word opgedeel in verskeie deeltjies met 'n sterk wand en het geen cilia nie. In ander gevalle migreer die protoplasma van die thallus na die vertakte rhizoiede en uit al hierdie spore kan nuwe plante ontwikkel as die omstandighede gunstig word.

(3) Dan kan ook al die protoplasma in die thallus saamtrek en 'n soort dikwandige akineet-vormige struktuur te vorm, wat bestand is teen droogte en weer kan ontkiem as die toestande gunstig word.

Daar is vier belangrike spesies van Botrydium: —

(*a*) *B. wallrothii:* Met 'n dik growwe wand van kalsium karbonaat.

(*b*) *B. granulatum:* Met 'n dun wand van kalsium karbonaat en met 'n effens groter thallus as (*a*).

The above-mentioned two species are fairly well distributed throughout the world.

(*c*) *B. divisum:* An Indian specie, with an amoebaoid thallus indentated without a regular pattern.

(*d*) *B. tuberosum:* Registered by Millar in U.S.S.R., and described by Prowazek in " Flagellatenstudien " Archiv. Protistenk. 2,195-212 of 1903.

Recently I found B. tuberosum in abundance on the banks of the Apies River in Daspoort, Pretoria, intermingled with B. tuberosum were also B. granulatum.

The thallus of B. tuberosum corresponds more or less with that of B. granulatum, direct sunlight and shade has the same effect here as in B. granulatum. The only marked difference being that the thallus of B. tuberosum is somewhat smaller, it also contains numerous chromatophores and nuclei.

The Rhizoid of B. tuberosum is differenciated from other Botrydia by the tuber-like structures on the extremities.

Reproduction takes place in more or less the same way as the other Botrydia, except in the case of drought, when the protoplasm of the thallus is contracted into globelike structures at the extremities of rhidzoids. Round spores with a definite double wall are formed in each of these tubers. When favourable conditions arise, these spores develop into new plants.

It seems that the wall of the thallus breaks open to allow zoospores to escape as soon as they are formed, so that they can unite in pairs, in the water.

Bogenoemde twee soorte is redelik goed verteenwoordig en word feitlik ooral aangetref.

(*c*) *B. divisum:* Gevind in Indië. Hier is die thallus ingekeep en vertakt met 'n onreëlmatige patroon.

(*d*) *B. tuberosum:* Wat onlangs geregistreer is deur Miller van Rusland; soos bekryf is deur Prowazek in „ Flagellatenstudien ", Archiv. Protistenk. 2,195—212 van 1903.

Onlangs het ek B. tuberosum op die walle van die Apiesrivier in Daspoort, Pretoria gevind, gemengd hiermee was ook B. granulatum.

Die thallus stem baie ooreen met B. granulatum, direkte sonlig en skadu het dieselfde uitwerking op B. tuberosum. Die enigste merkbare verskil is dat B. tuberosum se thallus effens kleiner is, dit bevat ook menigte chromatophore en nucleii.

Die rhizoiede van B. tuberosum verskil egter van die ander Botrydium soorte, deurdat daar 'n ronde uitgroeisel op die punte van die rhizoiede voorkom, waarvan die naam dan ook afgelei word.

Die voortplanting geskied op dieselfde manier as by B. granulatum, behalwe dat in die geval van droogte, die protoplasma saamtrek in die ronde vergrotings op die punte van die rhizoide en daar word 'n ronde spoor gevorm met 'n definitiewe dubbel wand, wat dan weer in 'n nuwe plant ontwikkel sodra gunstige tye aanbreek.

Dit blyk ook dat sodra daar zoöspore gevorm word in die thallus, dan bars die wand oop en die zoöspore ontsnap deur die opening, om buite te verenig.

Owing to the fact that B. tuberosum has been discovered only in U.S.S.R. (F. E. Fritch) it seems a reasonable important discovery for the study of this Siphonales genus in South Africa.

Ref.:

(1) Freshwater Algae of the United States. (Gilbert M. Smith.)
(2) The Algae and their Life Relations. (J. Tilden.)
(3) The Structure and Reproduction of the Algae. (F. E. Fritch.)

When this algae attains its largest form it is terrestial, and only becomes available as food for vegetarian fish after it is submerged and the zoospores are set free. The latter can, however, become very important by forming the initial stage in the feeding cycle of higher organisms and fish.

Aangesien B. tuberosum nog net in Rusland gevind is (F. E. Fritsch) blyk dit 'n redelike belankrike vonds te wees vir die studie van hierdie Siphonales genus in Suid-Afrika.

Ref.:

(1) Freshwater Algae of the United States. (Gilbert M. Smith.)
(2) The Algae and their Life Relations. (J. Tilden.)
(3) The Structure and Reproduction of the Algae. (F. E. Fritch.)

Wanneer die plant sy grootste vorm bereik, kom dit nie in die water voor nie. Dit word eers beskikbaar gestel as voedsel vir plantaardige vissoorte wanneer dit onderdompel word en die zoöspore vry-gestel word. Laasgenoemde kan baie belangrik wees deurdat dit die beginstadium vorm in die voedselketting van hoër organismes en vis.

A Note on the Drinking Habits of Hornbills

by

R. BIGALKE

Director of the National Zoological Gardens, Pretoria

MUCH uncertainty appears to exist about the drinking habits of the *Bucerotidae*. During a visit to the Kruger National Park in July of the year 1945, in the company of Dr. T. G. Nel and Mr. Dick Wolff, a total of five days was spent at the Lion or Lily Pan, a few miles south of Tshokwane. As there was ceaseless activity at this waterhole at that time, we remained there for from 2½ to 7 hours on the various days and saw a large number of animals of different kind coming to drink. During this time a number of Red-billed Hornbills (*Tockus erythrorhynchus rufirostris*) and Yellow-billed Hornbills (*Xanthorhynchus leucomelas*) were observed around the waterhole, but none made any attempt to drink water.

According to Stresemann (¹), O. Heinroth, the well-known ornithologist of Berlin, has stated that he could not remember seeing hornbills drink (presumably in the Zoological Gardens of Berlin).

In response to an enquiry from me, ranger L. B. Steyn of Tshokwane in the Kruger National Park wrote as follows on the 2nd October, 1948:—

> "I myself have never seen hornbills drinking water. An enquiry addressed to ranger Swarts, in whose section there are many Red-billed and Yellow-billed Hornbills, has had the same result. He has not seen one of them drinking water, but one of his camp natives claims that he saw the Red-billed Hornbill drinking. My native cook also states that he has seen a Red-billed Hornbill drinking at a waterhole near to my camp, but neither Swarts nor I were prepared to accept these statements until you advised me of your observation."

Opmerkings oor die Drinkgewoontes van Boskraaie

deur

R. BIGALKE

Direkteur van die Nasionale Dieretuin, Pretoria

DIT blyk dat daar 'n groot mate van onsekerheid bestaan oor die drinkgewoontes van die *Bucerotidae*. Gedurende 'n besoek aan die Nasionale Kruger-Wildtuin in Julie van die jaar 1945, in teenwoordigheid van dr. T. G. Nel en mnr. Dick Wolff, is vyf volle dae deurgebring by die Leeu- of Leliepan, 'n paar myl ten suide van Tshokwane. Omdat daar gedurige bedrywigheid by hierdie drinkplek was, het ons daar op die onderskeie dae van 2½ tot 7 uur gebly en groot getalle diere van verskillende soorte gesien wat kom drink. Gedurende hierdie tyd is 'n aantal rooibekboskraaie (*Tockus erythrohynchus rufirostris*) en geelbekboskraaie (*Xanthorhynchus leucomelas*) opgemerk om die drinkplek, maar nie een het 'n poging aangewend om te drink nie.

Volgens Stresemann (¹) het O. Heinroth, die bekende ornitoloog van Berlyn, verklaar dat hy nie kon onthou dat hy boskraaie sien drink het nie (vermoedelik in die Berlynse Dieretuin).

Na aanleiding van 'n navraag het veldwagter L. B. Steyn van Tshokwane in die Nasionale Kruger-Wildtuin op 2 Oktober 1948 soos volg aan my geskryf:—

> „Ek self het nog nooit gesien dat boskraaie water drink nie. Navraag by veldwagter Swarts, waar daar baie boskraaie is—rooi- en geelbek— het dieselfde resultaat gehad. Hy het nog nie een gesien drink nie, maar een van die kampbediendes het glo 'n rooibek dit sien doen. My kok sê hy het ook 'n rooibek by die watergat naby my kamp gesien drink. Nòg Swarts nòg ek was gewillig om hierdie getuie te aanvaar, maar u eie waarneming onderstreep dit wel."

In this connection the following observation made by me in the National Zoological Gardens on the 24th September, 1948, may be of interest: At 8.10 a.m. on the date indicated a Red-billed Hornbill (*T. e. rufirostris*) was seen to drink water in the Large Flight Aviary in the Zoo. The bird inserted the closed beak in the water and then rapidly moved the two tips against one another as if to collect water in the beak. It then raised its head and propelled the water backwards to the throat by means of rapid jerking movements of the head. Those movements are like those that the bird makes with the head when it wishes to swallow food that it has picked up. It seems clear that little water at a time was swallowed in this manner, but the bird presumably continues until satisfied.

It cannot be deduced from this observation that the Red-billed Hornbill drinks regularly in the veld, but the observation shows that the bird may drink water in the manner described. Whether Hornbills normally obtain sufficient water from their food is a matter that calls for investigation.

In hierdie verband mag die volgende waarneming wat deur my in die Nasionale Dieretuin op 24 September 1948 gemaak is, van belang wees: Om 8.10 vm. op die genoemde datum is gesien hoe 'n rooibekboskraai (*T. e. rufirostris*) in die Groot Vliegkooi in die Dieretuin water drink. Hy het die toe bek in die water gesteek en dan die twee punte vinnig teen mekaar beweeg om so te sê water met die snawel te versamel. Dan het hy die kop gelig en die water agtertoe na die keel laat beweeg deur middel van vinnige rukbewegings van die kop. Hierdie bewegings is soos dié wat die voël met die kop maak wanneer hy kos wil insluk wat opgetel is. Dit is duidelik dat baie min water op 'n keer op hierdie manier ingesluk was, maar vermoedelik hou die voël aan totdat hy versadig is.

Dit kan nie van hierdie waarneming afgelei word dat die rooibekboskraai gereeld in die veld drink nie, maar die waarneming wys dat die voël water mag drink soos hier beskrywe. Of boskraaie normaalweg genoeg water uit hul voedsel kry is 'n saak wat ondersoek moet word.

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The Breeding of Lions in Captivity

by

T. J. STEYN, M.Sc., F.Z.S.
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INTRODUCTION.

THE King of Beasts is and always has been a subject of particular interest. Consequently he figures largely in the writings of scientists, hunters and others. Regarding the reproduction of lions in the wild state, there has been much conjecture and uncertainty because accurate observation and statistics are made difficult by the nature of the subject.

In captivity the position is quite different and data in connection with gestation period, mating season, size

Die Teelt van Leeus in Gevangenskap

deur

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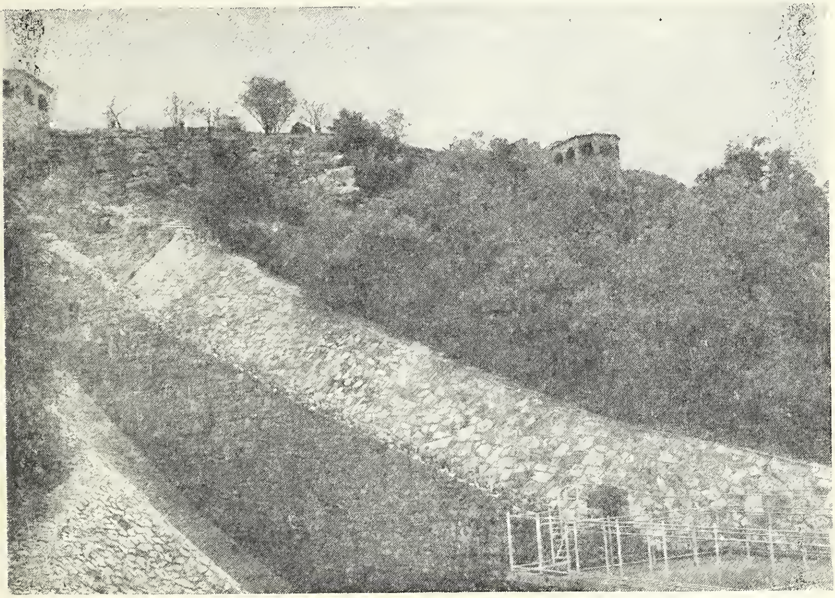
INLEIDING.

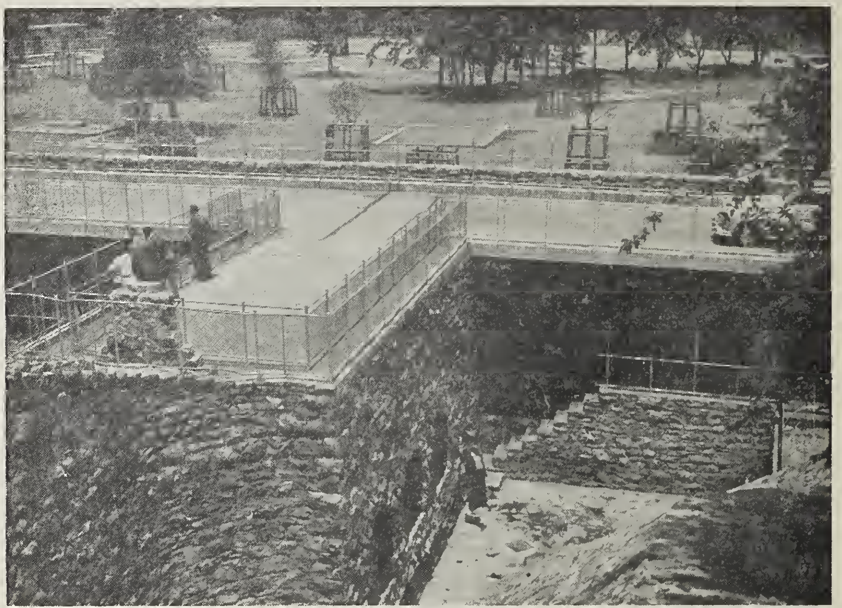
DIE Koning van die Diere is en was nog altyd 'n voorwerp van besondere belangstelling. Gevolglik is daar al baie oor hom geskrywe deur wetenskaplikes, jagters en andere. Oor sy voortplanting in die natuur is daar heelwat gissings gepubliseer want noukeurige waarneming en statistiek word deur die aard van die saak bemoeilik.

In gevangenskap is die toestand egter heelwat anders en gegewens oor aspekte soos dratyd, paarseisoen,



Natural bush in the spacious lion enclosure of the National Zoological Gardens, Pretoria. Two observation towers in the background.

Natuurlike bos in die ruim leeukamp van die Nasionale Dieretuin, Pretoria. Twee uitkyktorings op die agtergrond.



National Zoological Gardens, Pretoria. The road passes over the lions' "night-houses".
Nasionale Dieretuin, Pretoria. Die pad gaan oor die leeus se „naghokke".

of the litter. sex ratio, etc., can be obtained with a reasonable degree of accuracy. Although such results can give some idea of the position under natural conditions. they should not be accepted unconditionally as a true reflection of what takes place in the veld. Breeding conditions in the various zoos may be better, worse or approximately the same as in nature. An average of the results obtained from as many institutions as possible, where the greatest possible variety of conditions prevails, will probably approach the actual position in nature most closely.

Observations made at the Zoological Gardens of South Africa, Pretoria—where the conditions for lions are at present probably nearer to the natural state than in any other zoo in the world—are, on account of the above-

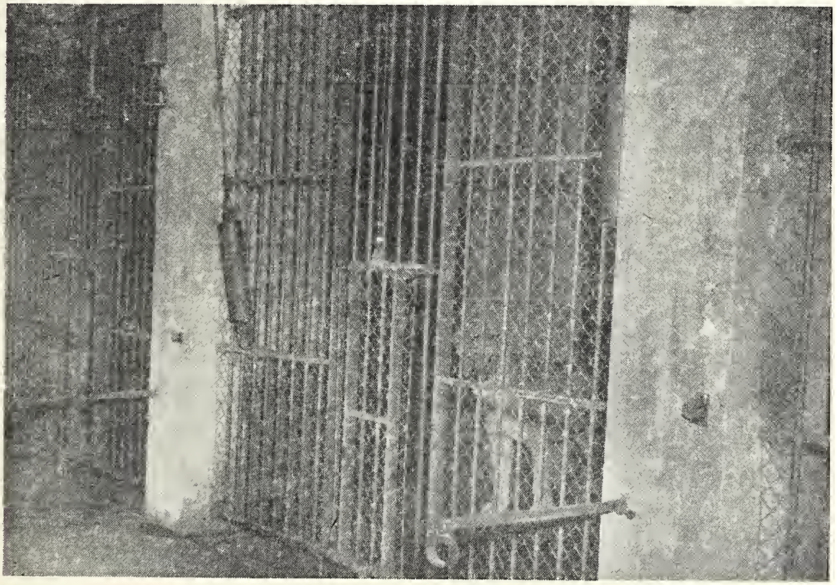
werpselgrootte, getalsverhouding tussen die geslagte, ens., kan met 'n redelike mate van betroubaarheid ingewin word. Hoewel sulke resultate 'n beeld van toestande in die vrye natuur kan verskaf, mag hulle egter nie sonder meer aanvaar word as 'n juiste weergawe van wat in die veld plaasvind nie. Teeltoestande in verskillende dieretuine mag beter, slegter of omtrent dieselfde wees as in die natuur. 'n Gemiddelde van die resultate wat verkry is van soveel moontlike inrigtings, waarin die grootste moontlike verskeidenheid van toestande heers, sal waarskynlik die naaste kom aan die werklike toestand in die natuur.

Die waarnemings wat gedoen is in die Nasionale Dieretuin van Suid-Afrika, Pretoria—waarin die toestande vir leeus vandag waarskynlik nader aan die natuurlike is as in enige ander dieretuin in die wêreld—is om bogenoemde redes vergelyk met dié van mentioned reasons, compared with those of three zoos in the northern hemisphere, viz. Dublin, Leipzig and London. In this connection it is important to note that the seasons in the case of the European institutions are adjusted throughout the text in order to conform with seasons in the southern hemisphere: For example, births that actually took place during January at Dublin, Leipzig and London are entered against "July" to be compared with births that occurred during July at Pretoria.

The striking resemblance between some graphs of the four different institutions will perhaps not seem so remarkable if it is borne in mind that lions were still found in Europe in quite recent geological periods(2) and that they are not as sensitive to cold as is generally believed in South Africa. At Dublin, for instance, lion cubs were born in the middle of winter and reared without artificial heating, while lions were kept in

drie dieretuine in die noordelike halfrond, nl. Dublin, Leipzig en Londen. In dié verband is dit belangrik om daarop te let dat die jaargetye in die geval van die Europese inrigtings deurgaans in die teks aangepas is sodat hulle ooreenstem met dié van die suidelike halfrond: Byvoorbeeld, geboortes wat in werklikheid gedurende Januarie te Dublin, Leipzig en Londen plaasgevind het, is teenoor „Julie" ingeskryf en vergelyk met geboortes wat gedurende Julie te Pretoria voorgekom het.

Die opvallende ooreenstemming tussen sommige grafieke vir die vier verskillende inrigtings is miskien nie so merkwaardig as in gedagte gehou word dat leeus in betreklik resente geologiese tye nog in Europa voorgekom het(2) en dat hulle nie so gevoelig vir koue is as wat algemeen in Suid-Afrika aangeneem word nie. Te Dublin, byvoorbeeld, is leeutjies in die middel van die winter gebore en sonder kunsmatige verwarming groot-



National Zoological Gardens, Pretoria. Two of the row of "night-houses", as seen from the service corridor.
Nasionale Dieretuin, Pretoria. Twee van die ry „naghokke", soos gesien vanaf die diensgang.

Canada without protective shelter at a temperature of 72 degrees below freezing point Fahrenheit.(5) As a matter of fact, even in Africa lions are found in parts with great climatic fluctuations. Furthermore, it must be remembered that there is in general very little difference between the non-climatic factors, such as feeding and housing, prevaling in the various zoos.

The writer wishes to take this opportunity of conceying his cordial thanks to Mr. Cedric L. Flood, Superintendent of the Zoological Gardens, Dublin, and Mr. C. S. Webb, Curator of Mammals and Birds at the Zoological Gardens, London, for the useful data that they have placed at his disposal. These data cover the periods 1857-1950 and 1929-1949 respectively. They were compared with results obtained during the period February, 1930—January, 1951 at Pretoria and 1881-1927 at Leipzig.(1) Together they give us the facts regarding more than 1,400 lion cubs, born in approximately 460 litters. In addition to the above information, free use has also been made of the other sources indicated in brackets.

HISTORICAL REVIEW.

From earliest times animals have been kept in captivity, at times as pets, or for religious purposes, or for observation and study and sometimes even for sensational reasons. The lion was a prominent member of the lastmentioned category and even in the remote past lions were captured by the Assyrians, Babylonians, Persians and Egyptians to be released again and then hunted by the rulers. From old documents it appears that exceptionally large numbers were sometimes kept and that cubs were born in captivity as early as 1115 B.C.(1)

In classical times Greeks and Romans went a step further. They kept lions and many other animals to provide sensational scenes in the

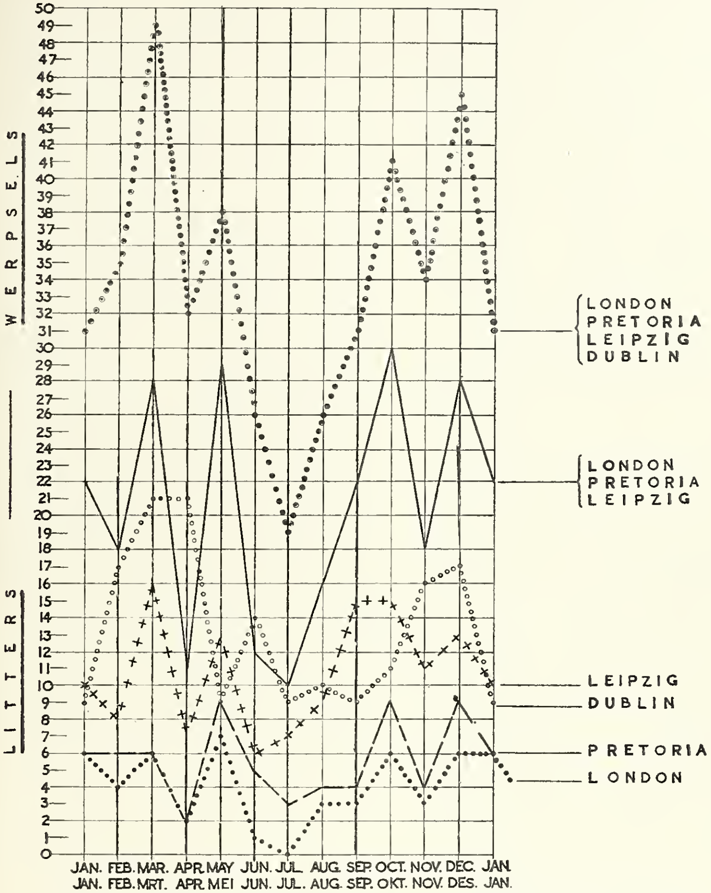
gemaak, terwyl leeus sonder beskutting in Kanada aangehou is in 'n temperatuur van 72 grade onder vriespunt Fahrenheit.(5) Trouens, selfs in Afrika kom die leeu voor in dele wat groot klimaatskommelinge toon. Verder moet onthou word dat daar in die algemeen maar min verskil is in die nie-klimaatsfaktore, soos voeding en behuising, wat in die verskillende dieretuine heers.

Die skrywer wil van hierdie geleentheid gebruik maak om mnr. Cedric L. Flood, Superintendent van die Dublinse Dieretuin, en mnr. C. S. Webb, Kurator van Soogdiere en Voëls in die Londense Dieretuin, hartlik te bedank vir die waardevolle gegewens wat hulle tot sy beskikking gestel het. Hierdie gegewens strek oor die jare 1857–1950 en 1929–1949 onderskeidelik. Hulle is vergelyk met resultate wat gedurende die tydperk Februarie 1930 tot Januarie 1951 te Pretoria en 1881–1927 te Leipzig verkry is.(1) Dit dek altesaam meer as 1,400 leeutjies wat in ongeveer 460 werpsels gebore is. Saam met bogenoemde inligting is ook vryelik gebruik gemaak van die ander bronne wat tussen hakies aangedui word.

HISTORIESE OORSIG.

Van die vroegste tye af is diere in gevangenskap aangehou; soms as troeteldiere, soms om godsdienstige redes; soms vir waarnemings- en studie-doeleindes, soms selfs as sensasiemiddels. Die leeu was 'n opvallende lid van laasgenoemde klas en reeds in die verre verlede is hy deur die Indiërs, Assiriërs, Babiloniërs, Perse en Egiptenare gevang om dan later weer losgelaat en deur die vorste gejag te word. Uit ou geskrifte blyk dat hulle soms in verbasend groot getalle aangehou is en dat daar reeds in die jaar 1115 v.C. welpies in gevangenskap gebore is.(1)

Die klassieke Grieke en Romeine het 'n stappie verder gegaan. Hulle het leeus en baie ander diersoorte aangehou terwille van die sensasie van die



NO. OF LITTERS PER MONTH —— AANTAL WERPSELS PER MAAND													
JAN. JAN.	FEB. FEB.	MAR. MRT.	APR. APR.	MAY MEI	JUN. JUN.	JUL. JUL.	AUG. AUG.	SEP. SEP.	OCT. OKT.	NOV. NOV.	DEC. DES.	ZOO —— DIERETUIN	
6	4	6	2	7	1	0	3	3	6	3	6	LONDON	• • •
6	6	6	2	9	5	3	4	4	9	4	9	PRETORIA	— —
10	8	16	7	13	6	7	9	15	15	11	13	LEIPZIG	+ + +
22	18	28	11	29	12	10	16	22	30	18	28	3 TESAME TOGETHER	——
9	17	21	21	9	14	9	10	9	11	16	17	DUBLIN	○ ○ ○
31	35	49	32	38	26	19	26	31	41	34	45	4 TESAME TOGETHER	● ● ●

GRAPH I GRAFIEK

arena. Thousands of spectators were enabled to see bloody encounters between animals and between man and beast. Christians and others were often thrown to lions that had been specially starved to provide enough "sport". Combats between lions and swordsmen were very popular and we read that Commodus destroyed more than a hundred lions in duels. (2)

That the breeding of lions received attention in those days is clear, *inter alia*, from the scientific works of the Greek scholar, Aristotle. Hhe knew, for instance, that litters could consist of 1-6 cubs and that Herodotus was wrong when he maintained that a female could only give birth to a single cub throughout her life-time, and that this cub found its way out of the womb by means of its sharp claws.(1)

Lions also played a prominent part in the "circus", a form of power display in the later Roman Empire, e.g. Pompey once exhibited 600 lions simultaneously. It is more than probable that some of these animals were bred in captivity.(1)

During the middle ages the menageries of rulers and the aristocracy naturally included lions. These wealthy people kept a large variety of animals as a private hobby and in competition with each other. Our modern zoological gardens developed directly out of these menageries. As their size increased and their scientific status was raised, they were thrown open to the public.(2) The history of the breeding of lions in captivity forms part of the history of the zoological garden itself.

The first zoological garden in England was evidently established early in the twelfth century at Woodstock by King Henry I. At the beginning of the thirteenth century, during the reign of Henry III, it was transferred to the Tower of London and it ultimately formed the nucleus of the modern zoological gardens at Regent's Park. In 1731 a great sensation was caused throughout England

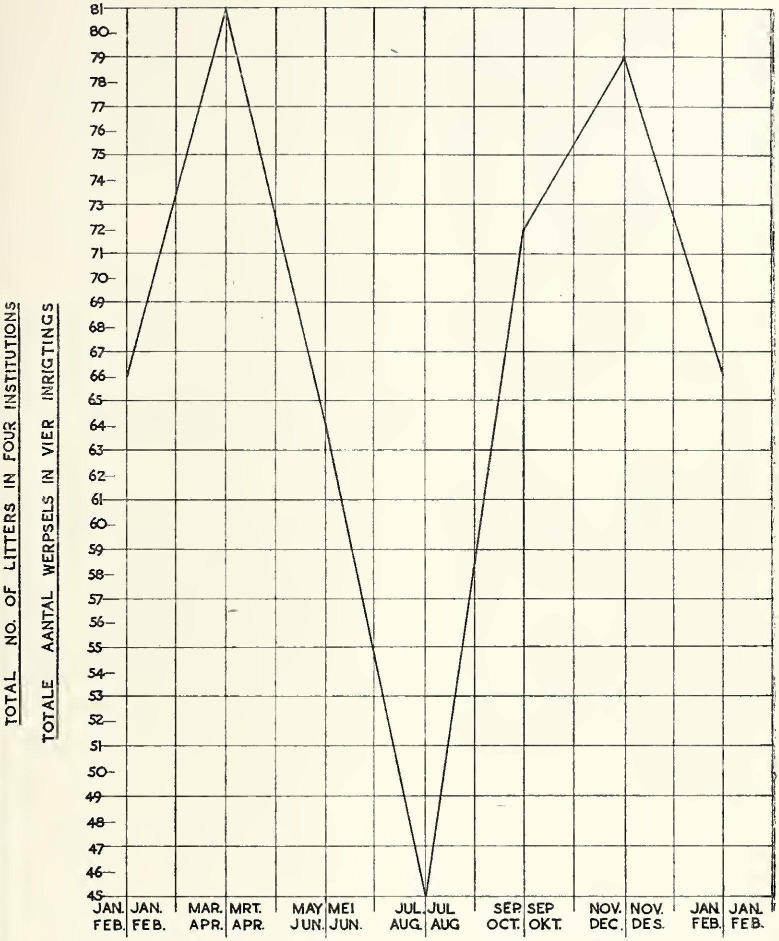
arena. Duisende toeskouers kon daar gereeld bloedige gevegte sien tussen diere of tussen mens en dier. Christene en andere wat hulle afkeur te kenne gegee het, is dikwels vir leeus gegooi wat spesiaal honger gehou is om genoeg „sport" te verskaf. Gevegte tussen leeus en swaardvegters was veral baie gewild en ons lees van Commodus dat hy meer as 'n honderd leeus in tweegevegte vernietig het.(2)

Dat die teelt van leeus ook in daardie dae aandag geniet het, blyk o.a. uit die wetenskaplike werke van die Griekse geleerde, Aristoteles. Hy het o.a. geweet dat werpsels uit 1–6 leeutjies kan bestaan en dat Herodotus verkeerd was toe hy beweer het dat 'n wyfie net eenkeer in haar lewe 'n enkele leeutjie kan voortbring en dat dié deur middel van sy skerp naels sy weg uit die baarmoeder vind.(1)

Leeus het ook 'n groot rol gespeel in die „sirkus", 'n vorm van magsvertoon in die latere Romeinse ryk, bv. Pompejus het eenmaal 600 stuks gelyktydig vertoon. Dit is hoogswaarskynlik dat sommige van hierdie diere ook geteel het terwyl hulle in gevangenskap was.(1)

Gedurende die Middel-eeue het die diereversamelings van vorste en die adel natuurlik ook leeus ingesluit. Hierdie welgesteldes het 'n groot verskeidenheid diere as privaat stokperdjie aangehou en met mekaar gewedywer. Direk uit dié versamelings het ons moderne dieretuine ontwikkel: Namate hulle omvang en wetenskaplike status vergroot het, is hulle vir die publiek oopgestel.(2) Die geskiedenis van die teelt van leeus in gevangenskap vorm 'n deel van die geskiedenis van die dieretuin self.

Die eerste dieretuin in Engeland is blykbaar vroeg in die twaalfde eeu te Woodstock gestig deur Koning Hendrik I. Aan die begin van die dertiende eeu, toe Hendrik III koning was, is dit oorgeplaas na die Toring van Londen, en uiteindelik het dit die kern geword van die moderne Londense dieretuin te Regent's Park. In 1731 is groot opspraak dwarsdeur



TOTALE AANTAL WERPSELS PER TWEE MAANDE — TOTAL NO. OF LITTERS FOR TWO MONTHS					
JAN./JAN. & FEB./FEB.	MAR./MRT. & APR./APR.	MAY/MEI & JUN/JUN.	JUL./JUL. & AUG./AUG.	SEP./SEP. & OCT./OKT.	NOV./NOV. & DEC./DES.
66	81	64	45	72	79

GRAPH 2 GRAFIEK

by the birth of a litter of lion cubs in the Tower.(2)

In the meantime a number of similar institutions originated on the continent of Europe. In this way Amsterdam could, for instance, accumulate enough lions towards the end of the fifteenth century, through its merchants, to be able to present 6 to Lübeck; and during the sixteenth century the Elector Augustus I built a large lion enclosure at Dresden. Although mention is made of litters at Florence and Naples, there is generally little information on the breeding of lions during this period. The earliest recorded birth in central Europe was probably that of 1669 which occurred in the Imperial collection of Neugebräu, later converted to the famous collection of Schönbrunn.(1)

By the establishment of the last-mentioned institution and of the Museum of Natural History at Paris (1793), the scientific direction in the development of zoological gardens was introduced. Thus the Zoological Society of London founded the Regent's Park Gardens in 1826 and a great many similar institutions were established all over the world during the following hundred years. Interest shifted from the travelling (and well-patronised) menageries to the permanent zoological gardens where the animals were housed in hygienic, scientific and (as far as possible) natural conditions. Just over a century ago there were only 11 reasonably large zoological gardens in the world, all of them in Europe. Fifty years later there were 57 and to-day there must be more than 400, with about 150 in America alone.(2)

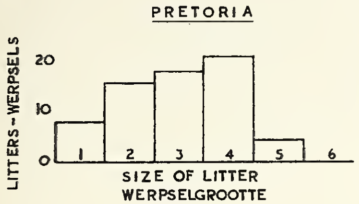
Most of these gardens have, to some extent, succeeded in breeding lions satisfactorily. The Phoenix Park Zoological Gardens at Dublin, established in 1830, have attained exceptional success since 1857, but apparently Leipzig was the most successful in this connection. Other old institutions deserving mention are

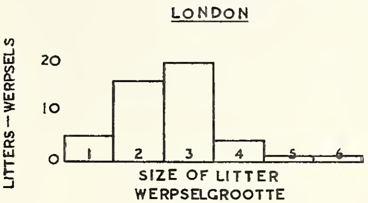
Engeland verwek deur die geboorte van 'n werpsel leeutjies in die Toring.(2)

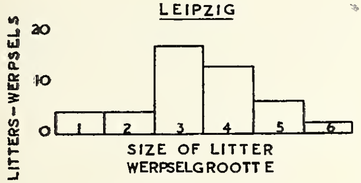
Intussen het talle soortgelyke inrigtings op die vasteland van Europa ontstaan. So het Amsterdam, byvoorbeeld, teen die end van die vyftiende eeu, deur bemiddelling van sy handelaars, genoeg leeus bymekaargemaak om ses stuks aan Lübeck te kon skenk, en in die sestiende eeu het Keurvors Augustus I 'n groot leeuhok te Dresden aangelê. Hoewel daar melding gemaak word van werpsels te Florence en Napels, is daar oor die algemeen maar min gegewens i.v.m. die teelt van leeus gedurende hierdie tydperk. Die vroegste aangetekende geboorte in middel-Europa was waarskynlik dié van 1669, en wel in die keiserlike versameling van Neugebräu wat later oorgegaan het in die beroemde versameling van Schönbrunn.(1)

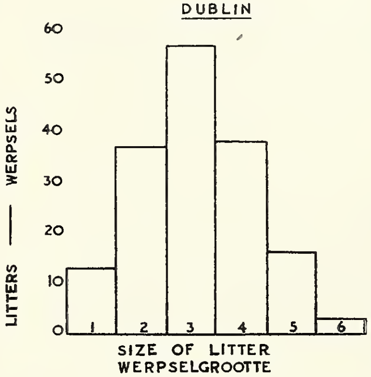
Met die ontstaan van laasgenoemde inrigting en die Natuurwetenskaplike Museum van Parys (1793) is die wetenskaplike rigting in die ontwikkeling van dieretuine ingelui. So het die Dierkundige Vereniging van Londen in 1826 die dieretuin van Regent's Park gestig en in die daaropvolgende honderd jaar is 'n groot aantal soortgelyke inrigtings oor die hele wêreld aangelê. Die belangstelling het van die reisende (en goedondersteunde) versamelings verskuiwe na die permanente dieretuine waar die diere onder higiëniese, wetenskaplike en (sover moontlik) natuurlike omstandighede gehuisves is. 'n Bietjie meer as 'n eeu gelede was daar maar net 11 redelike groot dieretuine in die wêreld, almal in Europa. Vyftig jaar later was daar 57 en vandag moet daar altesaam meer as 400 wees, met ongeveer 150 in Amerika alleen.(2)

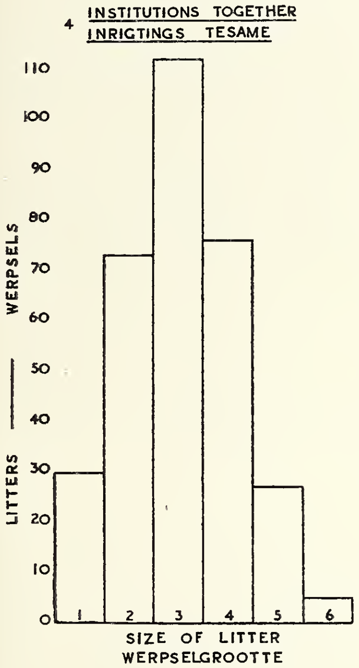
Die meeste van hierdie tuine het in 'n meerdere of mindere mate daarin geslaag om leeus doeltreffend te teel. Die dieretuin van Phoenix Park, Dublin, wat in 1830 gestig is, het sedert 1857 besondere sukses behaal, maar blykbaar span Leipzig in dié opsig die kroon. Ander ou inrigtings











	SIZE OF LITTER WERPSELGROOTTE	1	2	3	4	5	6
LITTERS — WERPSELS	PRETORIA	8	16	18	21	4	0
	LONDON	5	16	20	4	1	1
	LEIPZIG	4	4	17	13	6	2
	DUBLIN	13	37	57	38	16	2
	TOGETHER TESAME	30	73	112	76	27	5

GRAPH 3 GRAFIEK

the zoological gardens of Clifton (Bristol), Dresden and Berlin, together with the lion farm of Los Angeles (California). A number of private animal dealers (inter alia, the Hagenbecks) and circuses have also attained a certain amount of success in this direction.

GESTATION PERIOD.

The gestation period of lionesses in captivity has been studied many times and is given by different authors as 105, 106, 110 and 111 days.(3)

MATING SEASON.

If the average gestation period is taken into consideration, then the mating season can be deduced from the months when litters are born.

The following table illustrates the number of litters born in each month of the year, taken over a fairly long period, in each of four zoos:—

wat verdien om genoem te word, is die dieretuine van Clifton (Bristol), Dresden en Berlyn, asook die leeuplaas van Los Angeles (Kalifornië). 'n Aantal privaat dierehandelaars (o.a. die Hagenbecks) en sirkusse het ook heelwat sukses in die rigting behaal.

DRATYD.

Die dratyd van leeuwyfies is reeds dikwels in gevangenskap bsetudeer en word deur verskillende skrywers aangegee as 105, 106, 110 en 111 dae.(3)

PAARTYD.

Met inagneming van die gemiddelde dratyd, kan die paartyd afgelei word van die maande waarin die werpsels gebore word. Die volgende tabel toon die aantal werpsels wat in elke maand van die jaar, oor betreklike lang periodes, in elk van vier dieretuine gebore is:—

Zoo. Dieretuin.	Jan. Jan.	Feb. Feb.	March. Maart.	April. April.	May. Mei.	June. Junie.	July. Julie.	Aug. Aug.	Sept. Sept.	Oct. Okt.	Nov. Nov.	Dec. Des.	Total. Totaal.
Pretoria (Feb. 1930–Jan. 1951)........	6	6	6	2	9	5	3	4	4	9	4	9	67
* London/Londen (1929–1949).......	6	4	6	2	7	1	0	3	3	6	3	6	47
* Leipzig (1899–1927)	10	8	16	7	13	6	7	9	15	15	11	13	130
* Dublin (1857–1950)	9	17	21	21	9	14	9	10	9	11	16	17	163
TOTAL/TOTAAL	31	35	49	32	38	26	19	26	31	41	34	45	407

* Seasons adjusted to Pretoria.—Jaargetye aangepas by Pretoria.

From the above table it is obvious that lion cubs are born throughout the year. Only in the case of London there were no births during "July", but the average number of litters per calendar month is so low (less than 4) for that institution, that little value can be attached to this negative figure.

If the contents of this table are set out in the form of a graph (Graph

Hieruit blyk dit duidelik dat leeutjies in gevangenskap dwarsdeur die jaar gebore word. Slegs in die geval van Londen was daar gedurende „Julie" geen geboortes nie, maar die gemiddelde aantal werpsels per kalendermaand is so laag (minder as vier) vir daardie inrigting, dat daar nie veel waarde aan hierdie negatiewe syfer geheg kan word nie.

As die inhoud van hierdie tabel in grafiekvorm opgestel word (Grafiek

No. 1) then the following can be observed:—

(*a*) The general pattern of all the graphs (especially those for Pretoria, Leipzig and London) is so similar that the coincidence of the various crests and troughs can hardly be regarded as fortuitous.

(*b*) Generally there is a fairly sharp fall in autumn. (" April " in the case of Pretoria, London and Leipzig; " May " in the case of Dublin), followed by a rise during a single month.

(*c*) During the cold months " June " and " July " (" July " to " September " in the case of Dublin) there is a general fall in the birth rate.

(*d*) During the spring the same two-crested pattern of autumn is repeated, with Dublin again as the only exception. (Vide also graph for the four institutes together on graph No. 1.)

The Dublin graph clearly differs from the rest since—

(i) the first autumn rise starts earlier and lasts a month longer, with the result that the rest of the graph is also one month " late ";

(ii) the spring rise is not two-crested.

It is difficult to provide a reason for these deviations. Amongst themselves the other graphs also reveal slight differences (perhaps on account of feeding, climatic or other factors) but the case of Dublin draws attention to the words of Roberts (6) on the extinct Cape Lion (*Leo leo melanochaitus*): " It would be interesting to trace where the Dublin lions—which

No. 1), kan die volgende opgemerk word:—

(*a*) Die algemene patroon van al die grafieke (en veral dié vir Pretoria, Londen en Leipzig) is so eenders dat die verskillende hoogte- en laagtepunte beswaarlik as toevallig beskou kan word.

(*b*) Deurgaans is daar 'n betreklik skerp daling in die najaar („ Aprilmaand " in die geval van Pretoria, Londen en Leipzig; „ Meimaand " in die geval van Dublin), gevolg deur 'n styging gdurende 'n enkele maand.

(*c*) Gedurende die koue maande „ Junie " en „ Julie " („ Julie " tot „ September " in die geval van Dublin) is daar 'n algemene daling in die geboortesyfer.

(*d*) Gedurende die voorjaar word dieselfde tweepuntige patroon van die najaar herhaal, met Dublin weer as die enigste uitsondering. (Sien ook grafiek vir alvier inrigtings gesamentlik op Grafiek No. 1.)

Samevattend verskil die grafiek vir Dublin as volg van die andere:—

(i) Die eerste najaarstyging begin vroeër en hou 'n maand langer aan, met die gevolg dat die res van hierdie grafiek ook een maand „ laat " is.

(ii) Die voorjaarstyging is nie tweepuntig nie.

Dit is moeilik om die oorsaak van hierdie afwykinge vas te stel. Onderling toon die ander grafieke ook kleinere verskille (miskien as gevolg van voedings-, klimaats- of ander faktore), maar die geval van Dublin vestig die aandag op Roberts(6) se woorde oor die uitgestorwe Kaapse leeu (*Leo leo melanochaitus*): „ It would be intereshave been bred for many generations and disposed of to other Zoological Gardens—came from originally. Probably they were from the Cape Province, which was the most likely place for them to be captured and transhipped, though naturally as Africa became more opened up further specimens were later exported from other African countries and interbreeding with the original stock would produce less typical progeny". An attempt was made to trace the origin of the Dublin stock, but the present superintendent writes as follows: . . . . "I can find no trace of what locality our original Lions came from" . . . .

Although the total number of litters discussed here is fairly high (407), it is still possible that the four-crested nature of (most of) the graphs is caused by the narrow and artificial boundaries created by comparing the number of litters per calendar month. The total number of litters can, for instance, also be arranged as follows:—

TOTAL NUMBER OF LITTERS IN FOUR INSTITUTIONS.

Jan. and Feb.	March and April.	May and June.	July and Aug.	Sept. and Oct.	Nov. and Dec.
66	81	64	45	72	79

If these figures are drawn up in the form of a graph (Graph No. 2), then the four-crested form disappears.

SIZE OF LITTER.

A letter from Mr. Cedric L. Flood of Dublin contains the following: "I have been Superintendent here since 1938, and during my time one Lioness died giving birth to cubs. Four cubs were born and after death three more were found in the animal, so that this makes the largest litter I have known. Only the four cubs were recorded as we have never recorded unborn cubs."

ting to trace where the Dublin lions—which have been bred for many generations and disposed of to other Zoological Gardens—came from originally. Probably they were from the Cape Province, which was the most likely place for them to be captured and transhipped, though naturally as Africa became more opened up further specimens were later exported from other African countries and interbreeding with the original stock would produce less typical progeny". 'n Poging is aangewend om die oorsprong van die Dublinse stoet vas te stel, maar die huidige Superintendent skryf as volg: „I can find no trace of what locality our original Lions came from". . .

Hoewel die totale aantal werpsels wat hier behandel word, betreklik groot is (407), is dit tog moontlik dat die vierpuntige geaardheid van die (meeste) grafieke veroorsaak is deur die noue en kunsmatige grense wat gestel word deur die aantal werpsels per kalendermaand te vergelyk. Die totale aantal werpsels kan byvoorbeeld ook as volg ingedeel word:—

TOTALE AANTAL WERPSELS IN VIER INRIGTINGS.

Jan. en Feb.	Maart en April.	Mei en Junie.	Julie en Aug.	Sept. en Okt.	Nov. en Des.
66	81	64	45	72	79

As hierdie syfers in grafiekvorm opgestel word (Grafiek No. 2), dan verdwyn die vierpuntige vorm.

WERPSELGROOTTE.

'n Brief van mnr. Cedric L. Flood van Dublin bevat die volgende: „I have been Superintendent here since 1938, and during my time one Lioness died giving birth to cubs. Four cubs were born and after death three more were found in the animal, so that this makes the largest litter I have known. Only the four cubs were recorded as we have never recorded unborn cubs."

Roberts(6) says: "Three or four cubs form the usual litter, but as many as six and as few as one have been recorded."

The following table shows the number of litters born in each of the litter sizes in four zoos:—

Roberts(5) sê: „Three or four cubs form the usual litter, but as many as six and as few as one have been recorded."

Die volgende tabel toon die aantal werpsels wat in elk van die werpselgroottes in vier dieretuine gebore is:—

Zoo. Dieretuin.	Size of Litter.—Werpselgrootte.						
	1.	2.	3.	4.	5.	6.	6+.
Pretoria (Feb., 1930–Jan., 1951)............	8	16	18	21	4	0	0
London/Londen (1929–1949)...............	5	16	20	4	1	1	0
Leipzig (1919–1928)......................	4	4	17	13	6	2	0
Dublin (1857–1950)......................	13	37	57	38	16	2	0
Total: Four Institutions Totaal: Vier inrigtings............	30	73	112	76	27	5	0

These data are set out graphically on Graph No 3.

If a common statistical formula(4) is applied to the above totals for the four institutions, the following is found:—

(*a*) An average of 3·04 cubs per litter.
(*b*) A standard deviation of 1·14.

This gives us as standard for our population: 1·90–4·18, or roughly: 2–4.

It means—

(i) that in the four institutions collectively an *average of three cubs* were born per litter;
(ii) that *usually two, three or four* cubs were born per litter;
(iii) that one, five and six cubs per litter were exceptional.

It is interesting to note that the greatest number of cubs that constitutes the standard (namely 4), conforms with the number of teats of the lioness. Furthermore that Pretoria is the only institution that had more litters consisting of 4 than any other size. In the remaining three institutions the mode was 3 cubs per litter (*vide* Graph No. 3).

Hierdie gegewens word grafies voorgestel op Grafiek No. 3.

As bostaande totale vir die vier inrigtings volgens 'n bekende statistiese formule (4) verwerk word, word die volgende gevind:—

(*a*) 'n Gemiddelde van 3·04 leeutjies per werpsel.
(*b*) 'n Standaardafwyking van 1·14.

Die standaard vir ons kollektief is dus 1·90–4·18, of naastenby 2–4. Dit beteken—

(i) dat daar, in die vier inrigtings gesamentlik, *gemiddeld drie leeutjies* per werpsel gebore is;
(ii) dat *gewoonlik twee, drie of vier* leeutjies per werpsel gebore is;
(iii) dat een, vyf en ses leeutjies per werpsel in uitsonderlike gevalle voorgekom het.

Dit is interessant om op te merk dat die grootste aantal leeutjies wat die standaard vorm (naamlik 4), ooreenstem met die aantal tepels van 'n leeuwyfie. Verder is dié van Pretoria die enigste inrigting wat meer werpsels van 4 stuks gehad het as werpsels van enige ander grootte. In aldrie die ander dieretuine was die mode 3 leeutjies per werpsel (Sien Grafiek No. 3).

If the data for each of the four institutions are treated separately on the above method, then the following results will be obtained:—

Institution.	Average No. of Cubs per Litter.	Standard.
Pretoria (Feb., 1930–Jan., 1951)........	2·96	1·83–4·09
London (1929–1949)..	2·64	1·64–3·64
Leipzig (1919–1928)...	3·41	2·20–4·62
Dublin (1857–1950)..	3·08	1·95–4·21
Total: 4 Institutions	3·04	1·90–4·18

The average litter size varies continously in each institution:

From 1857 to 1891, 17 litters of 4 cubs each against 9 litters of 3 each were born at Dublin; from 1899 to 1905, 15 litters consisting of 3 cubs each were born successively, the smaller litter size thereby attaining a numerical advantage of 27 against 19 in a comparatively short period; this advantage has been maintained up to date.

At Leipzig the average litter size was 3·4 for the period 1919-1928, but during 1881-1890 it was 3·56.

The year 1942 was the turning point for lion-breeding at Pretoria. Formerly about three-quarters of the cubs were either still-born or lost shortly after birth, but as from that date hardly any losses occurred. At the same time the average litter size increased from 2·8 for the period 1930-1942 to 3·1 for the period 1942-1951. From 26th December, 1947, to 23rd October, 1948, 6 litters of 4 each were born successively. The most obvious reason for this improvement is probably that the animals settled down in the large enclosure of ¾ acre, with natural bush, in which they had been released a few years previously. (See photographs.)

As die gegewens vir elk van die vier inrigtings afsonderlik op bostaande metode verwerk word, word die volgende resultate verkry:—

Inrigting.	Gemiddelde aantal leeutjies per werpsel.	Standaard.
Pretoria (Feb. 1930–Jan. 1951).........	2·96	1·83–4·09
Londen (1929–1949)..	2·64	1·64–3·64
Leipzig (1919–1928)..	3·41	2·20–4·62
Dublin (1857–1950)..	3·08	1·95–4·21
4 Inrigtings tesame..	3·04	1·90–4·18

Die gemiddelde werpselgrootte wissel gedurig in elke inrigting:

Van 1857 tot 1891 is te Dublin 17 werpsels van 4 stuks elk gebore teenoor 9 werpsels van 3 stuks; van 1899 tot 1905 is agtereenvolgens 15 werpsels, elk bestaande uit 3 leeutjies gebore, sodat die kleiner werpselgrootte in 'n betreklik kort tyd 'n getallevoorsprong van 27 teenoor 19 behaal het; daardie voorsprong is tot op datum gehandhaaf.

Te Leipzig was die gemiddelde werpselgrootte 3·4 vir die tydperk 1919–1928, maar gedurende 1881–1890 was dit 3·56.

Vir Pretoria se leeuteelt was die jaar 1942 'n keerpunt: Voorheen is omtrent driekwart van die welpies óf dood gebore óf kort na geboorte verloor. maar van daardie datum af het feitlik geen verliese meer voorgekom nie. Terselfdertyd het die gemiddelde werpselgrootte gestyg van 2·8 vir die tydperk 1930–1942 tot 3·1 vir die tydperk 1942–1951. Van 26 Desember 1947 tot 23 Oktober 1948 is agtereenvolgens 6 werpsels van 4 stuks elk gebore. Die mees voor die hand liggende rede vir die verbeteringe is waarskynlik dat die diere tuis geraak het in die ruim hok van ¾ acre, met natuurlike bos, waarin hulle 'n paar jaar tevore losgelaat is (Sien fotos).

Observations in the National Zoological Gardens, Pretoria, confirmed the expectation that the litter size is, inter alia, affected by the age of the lionesses. Often the first and the last few litters of a lioness are small. Furthermore, young lionesses are not always the best mothers. The same was found in Leipzig.(¹)

NUMBER OF LIONS BRED.

The "lion factory" of Leipzig produced approximately 700 lions in the first fifty years of its existence (1878-1928). Dublin produced a total of 502 in 92½ years (November, 1857-June, 1950); Pretoria altogether 198 in 21 years (February, 1930-January, 1951) and London a total of 124 in 20 years (1929-1949).

The relative amount of success attained by the different institutions cannot, however, be judged by these figures only; Leipzig, for instance, kept up to 40 lions at one time while Pretoria had an average of not more than 8 (2 males, 6 females).

SEX RATIO.

Apparently slightly more males than females are usually born. Of the 502 lion cubs born at Dublin from 1857 to 1950, 234 or 46·6 per cent. were males and 200 or 39·8 per cent. were females, while the sexes of 68 or 13·6 per cent. were unknown.

Of the 393 cubs born at Leipzig from 1899 to 1928, 210 or 53·4 per cent. were males and 183 or 46·6 per cent. were females.(¹)

At Pretoria the position was different: From 17 February, 1930 to 26 November, 1942 (when many of the 80 cubs were still-born or lost, shortly after birth) there were 25 (or 31·25 per cent.) males, 28 (or 35 per cent.) females and 27 (or 33·75 per cent.) of undetermined sex. From 17 December, 1942 till 21 January, 1951 (when only 8 of the 118 cubs were dead at or shortly after birth, and the sexes

Waarneminge in die Nasionale Dieretuin, Pretoria, het die verwagting bevestig dat werpselgrootte o.a. beïnvloed word deur die ouderdom van die wyfies. Die eerste en die laaste paar werpsels van 'n wyfie is dikwels klein. Verder is ook jong leeumoeders nie altyd die beste moeders nie. In Leipzig is dieselfde gevind.(¹)

AANTAL LEEUS GETEEL.

Die „leeufabriek" van Leipzig het in die eerste vyftig jaar van sy bestaan (1878–1928) ongeveer 700 leeus geproduseer. Dublin het in 92½ jaar (November 1857 tot Junie 1950) 'n totaal van 502 voortgebring; Pretoria in 21 jaar (Februarie 1930 tot Januarie 1951) altesaam 198, en Londen in 20 jaar (1929–1949) 'n totaal van 124.

Die relatiewe mate van sukses wat deur die verskillende inrigtings behaal is, kan egter nie bloot volgens hierdie syfers beoordeel word nie: Leipzig, byvoorbeeld, het tot 40 leeus op een tydstip aangehou terwyl Pretoria gemiddeld nie meer as 8 stuks (2 mannetjies, 6 wyfies) gehad het nie.

GESLAGSVERHOUDING.

Blykbaar word daar gewoonlik effens meer mannetjies as wyfies gebore. Van die 502 leeutjies wat van 1857 tot 1950 te Dublin gebore is, was 234 stuks of 46·6 persent mannetjies en 200 stuks of 39·8 persent wyfies, terwyl die geslag van 68 stuks of 13·6 persent onbekend is.

Van 393 leeutjies wat van 1899 tot 1928 te Leipzig gebore is, was 210 stuks of 53·4 persent mannetjies en 183 stuks of 46·6 persent wyfies.(¹)

Te Pretoria was die toestand anders: Van 17 Februarie 1930 tot 26 November 1942 (toe baie van die 80 leeutjies dood gebore is of kort na geboorte gesterf het) was daar 25 (of 31·25 persent) mannetjies, 28 (of 35 persent) wyfies en 27 (of 33·75 persent) waarvan die geslag nie bepaal is nie. Van 17 Desember 1942 tot 21 Januarie 1951 (toe slegs 8 van die 118 leeutjies met geboorte of kort daarna dood was en of all were known) there were 59 (or 50 per cent.) males and 59 (or 50 per cent.) females.

The totals of the above-mentioned figures are as follows:—

Males.	Females.	Sex Unknown.	Grand Total.
528	470	95	1,093

If the unsexed cases are left out of count, then the ratio will be 52·9 per cent. males to 47·1 per cent. females.

DEATH RATE.

If more males than females are born, then it is possible that the equilibrium between the sexes is maintained by a higher death rate among males. According to Gebbing(¹) it was actually found that of 100 lion cubs that died shortly after birth at Dublin, 53 were males and 47 females. However, he could not confirm this finding with data from Leipzig, since there the death rates of the two sexes were about equal.

Of the large percentage of lion cubs that were dead at or shortly after birth at Pretoria from 1930 to 1942, 15 were males and 19 females, while the sexes of 25 were unknown. The lastmentioned figure being so high, little value can be attached to the ratio 15:19. (Perhaps there were actually more males than females amongst the cubs that were born dead, and the majority of the cases of unsexed cubs were probably still-births.) After 1942, however, only 8 of the 118 cubs (59 males and 59 females) were dead at or shortly after birth, and they were 5 males against 3 females.

At Leipzig the third and ninth days after birth were found to be critical.(¹) Also at Pretoria the

almal se geslag bekend was) was daar 59 (of 50 persent) mannetjies en 59 (of 50 persent) wyfies.

Die totaal van bogenoemde syfers is as volg:

Mannetjies.	Wyfies.	Geslag onbekend.	Groottotaal.
528	470	95	1,093

As die gevalle waarvan die geslag onbekend is, buite rekening gelaat word, dan is die verhouding 52·9 persent mannetjies teenoor 47·1 persent wyfies.

STERFTESYFER.

As daar meer mannetjies as wyfies gebore word, dan is dit moontlik dat die balans tussen die geslagte bewaar word deur 'n hoër sterftesyfer onder die mannetjies as onder die wyfies. Volgens Gebbing(¹) is daar ook werklik gevind dat, uit 100 leeutjies wat met of kort na geboorte te Dublin dood is, 53 mannetjies en 47 wyfies was. Hy kon dié bevinding egter nie staaf met gegewens uit Leipzig nie, aangesien die sterftesyfer daar ongeveer gelyk tussen die twee geslagte was.

Van die groot persentasie leeutjies wat van 1930 tot 1942 te Pretoria met of kort na geboorte dood is, was 15 mannetjies en 19 wyfies, terwyl die geslag van 25 onbekend is. Aangesien laasgenoemde syfer so hoog is, kan daar ongelukkig nie te veel waarde aan die verhouding 15 tot 19 geheg word nie. (Miskien was daar juis meer mannetjies as wyfies onder die doodgebore leeutjies; en die meerderheid van die gevalle waar die geslag nie aangeteken is nie, was waarskynlik van dié wat dood gebore is.) Na 1942 is egter slegs 8 van die 118 leeutjies (59 mannetjies teenoor 59 wyfies) met of kort na geboorte dood, en hulle was 5 mannetjies teenoor 3 wyfies.

Te Leipzig is gevind dat die derde en die negende dae na geboorte die kritieke tye is.(¹) Ook te Pretoria het greatest number of deaths occurred within the first couple of days, and the reason was usually that very young or decrepit mothers either did not accept the cubs or did not have enough milk for them. In such cases it is very doubtful whether the sex of the cubs can have anything to do with the death rate.

It is exceptional that all the cubs out of a litter of six are reared, but it has actually happened in a few cases.(¹)

From inquiries by European animal dealers, it seems that they are not keen to buy cubs under the age of three or four months. In addition to the high price of meat, the death rate of young lion cubs is also given as a reason. Although it is desirable to leave the cubs with the mother until they are weaned (about three months), experience at Pretoria has taught that there is little reason why a healthy cub should be lost if taken away from the mother at the age of even one month.

Apparently quite a number of young lions are lost elsewhere at the beginning of the second year when the canines are shed(¹), but at Pretoria such losses are unknown.

FERTILITY AND DURATION OF LIFE.

Cases are known where both males and females bred before they were 2 years old, but in general males do not breed before they are 5 to 6 and females not before they are 3 to 4 years old. It is also stated that at least one female still bred when she was 22, but most lions apparently do not breed after their fifteenth year. In any case they are then already very near the end of their lives.(¹)

The short gestation period has made it possible for as many as 3 litters to be born of the same female in one calendar year. This, however, is exceptional and the average females in captivity do not breed more than

die grootste sterfte binne die eerste paar dae voorgekom en die rede was gewoonlik dat heeltemal jong of afgeleefde moeders òf nie die welpies aangeneem het nie òf nie genoeg melk vir hulle gehad het nie. In sulke gevalle is dit baie twyfelagtig of die geslag van die welpies enigiets met die sterftesyfer te doen kan hê.

Dit is uitsonderlik dat al die leeutjies uit 'n werpsel van 6 stuks grootgemaak word, maar dit het tog in enkele gevalle gebeur.(¹)

Uit die navrae van Europese dierehandelaars blyk dit dat hulle nie graag welpies van onder drie of vier maande aankoop nie. Behalwe die hoë prys van vleis word ook die sterftesyfer van jong leeutjies as rede aangegee. Hoewel dit verkieslik is om die leeutjies by die moeder te laat tot hulle gespeen is (ongeveer drie maande), het ondervinding in Pretoria egter geleer dat daar min rede bestaan waarom 'n gesonde welpie verloor moet word as dit op die ouderdom van selfs een maand van die moeder verwyder word.

Elders word blykbaar heelwat leeutjies verloor terwyl die slagtande aan die begin van die tweede lewensjaar gewissel word(¹), maar in Pretoria is sulke verliese onbekend.

VRUGBAARHEID EN LEWENSDUUR.

Gevalle is bekend van beide mannetjies en wyfies wat geteel het voor hulle 2 jaar oud was, maar oor die algemeen teel mannetjies nie voor hulle 5 of 6 en wyfies nie voor hulle 3 of 4 jaar oud is nie. Verder word beweer dat minstens een wyfie nog geteel het toe sy 22 was, maar die meeste leeus teel waarskynlik nie meer na hulle vyftiende jaar nie. In elk geval is hulle dan reeds baie na aan die einde van hulle lewens.(¹)

Die kort dratyd maak dit moontlik dat tot 3 werpsels reeds binne een kalenderjaar deur dieselfde wyfie voortgebring is. Dit is egter baie uitsonderlik en gemiddeld teel wyfies in gevangenskap seker nie meer as eenkeer per jaar nie. Die Leipzigse ,, Busonce per year. "Bussy" from Leipzig had a litter every 10 months as from her third year, and altogether produced and reared 46 cubs.(1) She died in 1893 at the age of 13½ years. Another lioness lived for 16 years in Phoenix Park and produced a total of 55 cubs.

FEEDING.

If the mother cannot rear them for some reason or other, it is best to give the cubs to a dog bitch. It is difficult to rear them on a bottle because they usually develop enteritis; to replace the mother's milk is probaby not such a great problem as getting a substitute for the female's tongue which acts as a cleansing, laxative and digestive agent. Luke-warm water and cotton-wool are successful to a limited extent only.

The following feeding is giving good results at Pretoria if a lion cub of one month is removed from its mother:—

Up to 2 *months.*

Malted milk as directed for a baby of the same age, with the addition of 3 to 4 drops of cod liver oil once a day.

Up to 3 *months.*

(*a*) Malted milk as directed for a baby of the same age.

(*b*) About ½ lb. of lean meat on a bone which is tied in a hanging position, twice a day.

(*c*) Strewn over the meat, once a day, alternately one of the following: (i) ½ teaspoonful of cod liver oil; (ii) ¼ teaspoonful of bonemeal; (iii) ¼ teaspoonful of dried hops.

After 3 *months.*

(*a*) Decrease the milk gradually and increase the meat proportionately.

(*b*) Proceed with the cod liver oil, bonemeal and hops as before.

A full-grown lion receives 9-12 lbs. of fresh meat, containing not more than 15 per cent. bone and not more than 5 per cent. fat, once per day (mornings) during 6 days of the week. On the seventh day each receives only a small handful of green grass. It

sy" het van haar derde jaar af elke 10 maande 'n werpsel gehad en het altesame 46 leeutjies in die wêreld gebring en self grootgemaak.(1) Sy is in 1893 op 13½ jarige ouderdom dood. 'n Ander wyfie het vir 16 jaar in Phoenix Park gelewe en altesaam 55 welpies voortgebring.

VOEDING.

As die moeder hulle om die een of ander rede nie kan versorg nie, is dit die beste om klein welpies aan 'n hondeteef te gee. Dit gaan moeilik om hulle met 'n bottel groot te maak want hulle kry gewoonlik dermontsteking. Om die moedersmelk te vervang, is waarskynlik nie so'n groot probleem as om 'n plaasvervanger vir die wyfie se tong as reinigings-, lakseer- en spysverteringsmiddel te vind nie. Lou water en watte lewer slegs 'n beperkte mate van sukses.

Die volgende voeding lewer goeie resultate in Pretoria as 'n leeutjie van een maand oud van die moeder verwyder word:—

Tot 2 *Maande.*

Moutmelk soos voorgeskrywe vir 'n baba van dieselfde ouderdom, met die toevoeging van 3 tot 4 druppels lewertraan eenmaal per dag.

Tot 3 *Maande.*

(*a*) Moutmelk soos voorgeskrewe vir 'n baba van dieselfde ouderdom.

(*b*) Omtrent 'n halfpond maer vleis aan 'n been wat in 'n hangende posisie vasgemaak word, tweemaal per dag.

(*c*) Gestrooi oor die vleis, eenmaal per dag, afwisselend een van die volgende:—

(i) ½ teelepelvol lewertraan;
(ii) ¼ teelepelvol beenmeel;
(iii) ¼ teelepelvol droë hop.

Na 3 *Maande.*

(*a*) Verminder die melk geleidelik en vermeerder die vleis na verhouding.

(*b*) Gaan voort met die lewertraan, beenmeel en hop, soos voorheen.

'n Volwasse leeu ontvang gedurende ses dae in die week, eenmaal per dag (soggens), 9 tot 12 pond vars vleis wat nie meer as 15 persent been en nie meer as 5 persent vet bevat nie. Op

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serves, amongst others, as an emetic and helps the animal to get rid of indigestable matter (e.g. pieces of bone).

Donkey, mule and horse meat is chiefly used on account of the high price and the scarcity of beef. Apparently it is at least as good as beef.

Expectant and nursing mothers receive half a tablespoonful of tricalcium-phosphate per gallon of drinking water.

HOUSING.

The full-grown lions in the new lion enclosure at Pretoria remain outside night and day, summer and winter. They (one male and four or more females) only come into the " night-houses " in the morning to eat. While they are locked up there the large camp is cleaned.

As soon as it is observed that a female is expecting (usually only a few days before the birth), she is admitted through sliding doors into a large room or " breeding cage " where straw and drinking water containing tricalcium-phosphate are provided. Here she remains locked in for approximately a month. By this time the cubs are strong enough to go out with their mother occasionally for a day, while the other full-grown lions are locked up temporarily. Shortly afterwards the cubs begin to eat and are then removed to separate cages. If they are not required by the zoo, then they are sold or exchanged at ages usually ranging from 1 to 3 months.

MARKET VALUE.

During the war years, when there was no export market, lion cubs were sold in Pretoria at £1 each. At present they fetch £40 a piece and the price still shows an upward tendency.

die sewende dag ontvang elkeen net 'n klein handjievol groen gras. Dit dien o.a. as vomitief en help die dier om van onverteerbare materiaal (bv. stukkies been) ontslae te raak.

As gevolg van die hoë prys en skaarste van beesvleis word hoofsaaklik van donkievleis maar ook van muil- en perdevleis gebruik gemaak. Skynbaar is dit ten minste net so goed as beesvleis.

Verwagtende en sogende moeders kry 'n halwe eetlepelvol trikalsiumfosfaat per gelling drinkwater.

HUISVESTING.

Die volwasse leeus in Pretoria se nuwe leeukamp loop dag en nag, somer èn winter, buite. Hulle, een mannetjie en vier of meer wyfies, kom net soggens in die „ naghokke " in om te eet. Terwyl hulle daar opgesluit is, word die ruim kamp skoongemaak.

Sodra opgemerk word dat 'n wyfie verwag (gewoonlik slegs 'n paar dae voor die bevalling), word sy deur skuifdeure toegang verleen tot 'n spesiale groot kamer of „ broeihok " wat voorsien is van strooi en van drinkwater wat trikalsiumfosfaat bevat. Daar bly sy opgesluit vir ongeveer 'n maand. Dan is die kleintjies sterk genoeg om af-en-toe vir 'n dag saam met die moeder uitgelaat te word terwyl die ander groot leeus tydelik opgesluit is. Kort daarna begin die welpies vreet en word dan na afsonderlike hokke verwyder. As die dieretuin hulle nie self nodig het nie, word hulle verkoop of verruil op ouderdomme wat gewoonlik wissel van een tot drie maande.

MARKWAARDE.

Gedurende die oorlogsjare, toe daar geen uitvoermark was nie, is leeuwelpies in Pretoria verkoop teen £1 elk. Op die oomblik behaal hulle £40 stuk en die prys toon nog steeds 'n stygende neiging.

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BOESMAN EN SY OPPASSER (Foto/Photo: S. S. du Plessis) BOESMAN AND HIS ATTENDANT

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DIE UITKEN VAN BILTONG

deur H. P. A. de Boom

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DIE aanvraag na biltong, daardie tipies Suid-Afrikaanse lekkerny, het aanleiding gegee tot grootskaalse en roekelose wilduitroeiing deur persone wat ongelukkig eie winsbejag bo 'n patriotiese trots op 'n groot nasionale bate stel. Die Transvaalse Wildordonnansie (No. 23 van 1949, soos gewysig) het hieraan perke probeer stel. Daar het egter 'n ernstige wetsprobleem opgeduik. Hoe kan 'n mens voor die hof bevredigende bewys lewer dat 'n bepaalde biltong of biltonge van sekere tipes wild verkry is, en nie van beesvleis gemaak is, soos byna altyd deur die beskuldigdes aangevoer word nie? Hoe kan 'n mens seker wees dat onskuldige persone voor die wet gevrywaar word? Hierdie probleem is aan die veeartsenykundige laboratorium te Onderstepoort gestel.

Daar bestaan 'n metode om te toets of bloed of ander biologiese materiaal van een of ander diersoort afkomstig is. Die beginsel werk as volg: —

'n Proefdier (bv. konyn) word gereeld met bloed van bv. 'n bees ingespuit. Na 'n ruk sal dié konyn se liggaam weerstand teen die beesbloed begin opbou, op dieselfde wyse asof die beesbloed 'n siektekiem is; met ander woorde in die konyn se bloed sal teëliggame (presipitiene in hierdie geval) teen beesbloed gevind word. As nou van die konyn se bloed getap word, toegelaat word om te stol, die bloedwei (serum) van die stolsel afgetrek word, en onder bepaalde omstandighede by beesserum in 'n proefbuisie gevoeg word, sal die beesserum vertroebeling, vlokking en afsakking (presipitasie) wys, terwyl 'n ander soort bloed (bv. mens- of perdebloed) onaangetas sal bly. Op dieselfde wyse sou mens van vleis of biltong 'n ekstrak kon maak en dit teen bloedwei van 'n konyn wat tevore deur sulke inspuitings gevoelig gemaak is, kon toets. 'n Presipitasie sou in positiewe gevalle getoon word. Teoreties is dit alles goed en wel, maar in die praktyk is bloed- of weefselsoorte van naverwante diere geneig om dieselfde reaksie te gee, en moet mens die toetse tegnies baie verfyn deur byvoorbeeld 'n hele reeks verdunnings van die serum te maak. Veral by die beesfamilie—en al ons wildsbokke ressorteer hieronder—is hierdie neiging baie sterk. Om dus betroubare toetse te maak, sou baie navorsingswerk beteken, asook die aanhou van 'n groot aantal proefdiere, ten minste twee of drie vir elke wildsoort. Die koste van so 'n ondersoek van bepaalde biltongmonsters sou buite alle verhouding staan tot die doel wat beoog word.

Mikroskopies kan die spiere (d.i. vleis) van die verskillende diersoorte nie onderskei word nie. Chemiese verskille, indien enige, is nog nie goed genoeg uitgewerk om as 'n toets vir wetsdoeleindes te dien nie. Ook is onbekend watter veranderings uitdroog van vleis en die behandeling met sout en selfs speserye op die vleis het, behalwe natuurlik dat daar 'n groot hoeveelheid water onttrek word.

Om op die smaak of reuk af te gaan, is onbetroubaar. 'n Paar voorlopige toetse in hierdie opsig gedoen, het dit gou aangetoon. Moontlik kan 'n persoon met 'n goed ontwikkelde smaaksin na baie ervaring redelik betroubare resultate lewer.

THE IDENTIFICATION OF BILTONG

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THE demand for biltong, that typical South African delicacy, led to the reckless destruction of game on an unprecedented scale by persons to whom personal gain unfortunately counts more than patriotic pride in a great national asset. The Transvaal Game Ordinance (No. 23 of 1949, as amended) attempted to curb this process. A serious legal problem arose, however. How could satisfactory proof be adduced in court that certain specimens of biltong had been made from game and not from beef, as was nearly always claimed by the accused persons? How could the innocent be safe-guarded? This problem was put to the Veterinary Research Laboratory at Onderstepoort.

A method exists by means of which the origin of blood or other biological material from any particular species may be assessed with accuracy. The principle is as follows:—

A laboratory animal (e.g. a rabbit) is regularly injected with say bovine blood. After a while the rabbit's body starts to develop resistance as though this foreign blood were a noxious organism; that is, anti-bodies (precipitins in this case) will be found in the rabbit's circulation. Now, if blood is drawn from the rabbit and allowed to coagulate, the serum separated from the clot and added to bovine serum in a test tube under specific circumstances, a turbulence, flocculation and precipitation will be shown, whilst another kind of blood (e.g. human or equine) will remain unaffected. In the same way an extract of meat or biltong can be made and tested against serum of a rabbit which has been sensitized by such injections. A precipitation indicates a positive result. Theoretically this may sound well, but in practice blood or tissues of related species tend to give a similar reaction and the tests have to be refined greatly by, for instance, making a series of dilutions of the serum. Especially in the bovine family under which all our species of buck are classified, this tendency is very strong indeed. Devising fool-proof methods would mean a great deal of research work, as well as keeping a large stock of laboratory animals, at least two or three for every species of game. The cost of such an analysis would be out of all proportion to the purpose in view.

Microscopic differentiation of the muscle (meat) of the various species is impossible. Chemical differences, if any, have not been determined extensively enough to serve as a basis of medico-legal tests. It is also not known what changes the drying of the flesh and the treatment thereof with salt and even spices may have, except naturally the loss of appreciable quantities of water.

Taste and smell are unreliable guides. A few preliminary tests soon proved this point. It is possible that an experienced person with a well developed gustatory sense may obtain reasonably reliable results.

The presence or absence of fat obviously is no proof. Admittedly the nature of the fat, if present, can give one a reasonably sound indication whether one is dealing with equine, porcine or bovine meat. The texture

Die aan- of afwesigheid van vet is natuurlik geen bewys nie. Weliswaar kan mens van die aard van die vet, indien dit teenwoordig is, 'n redelike indruk kry of mens met vleis van die perdefamilie, dan wel met die varkfamilie of beesfamilie te doen het. Die tekstuur van die vleis of biltong kan ook soms nuttig wees om 'n aanduiding te gee; 'n mens dink byvoorbeeld aan die growwe tekstuur van wildebeesbiltong—maar veel verder as dit kan 'n mens nie kom nie.

In enige groterige hoeveelheid biltong sal daar altyd stukke gevind word waaraan hare vassit, veral in daardie gevalle waar die biltong inderhaas op groot skaal onder gewone veldomstandighede voorberei word. Somtyds word nog klein stukkies vel aan die biltong gevind. Dis werklik verbasend hoeveel hare 'n mens na 'n sorgvuldige ondersoek, desnoods met 'n handlens, kan vind.

In die kriminologie was uitkenning van hare alreeds lank 'n gevestigde praktyk.(1) (2) Meer as honderd jaar gelede is daar deur die identifikasie van hare die deurslag aan 'n moordsaak gegee, en is 'n moordenaar wat anders sou vrygespring het, galg-toe gestuur. Die vraag in die geval van biltong doem natuurlik op: in hoeverre is die aanwesigheid van hare van 'n sekere diersoort bewys dat die betrokke stuk biltong van daardie besondere diersoort afstam. Absolute bewys is dit nie, en die hof moet volgens bykomstige getuienis in elke geval sy oordeel vel. Aangesien wildshare nie normaalweg op sulke plekke op 'n werf of in

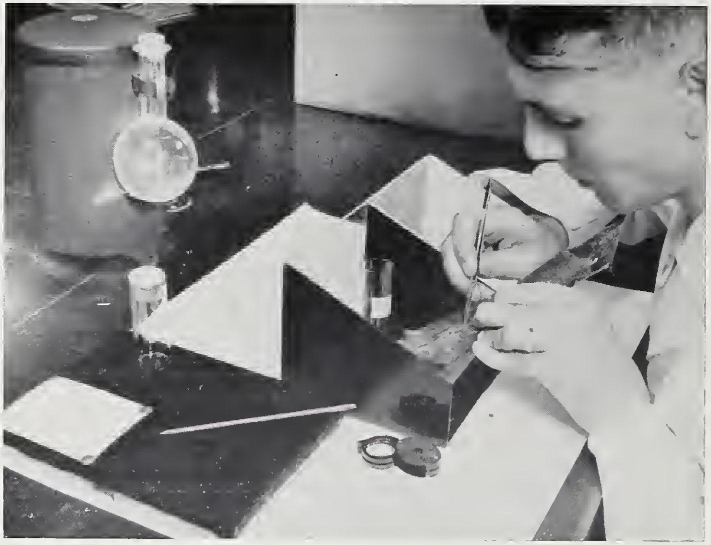


FOTO 1.—Verwydering van hare van 'n stuk biltong. Let op die kassie waarin dit gedoen word. Langsaan lê 'n handlens en die pen waarmee vasgekoekte hare losgewoel word. Dit lê op die sorteerplankie en die monster-flessies staan byderhand.

PHOTO 1.—Removal of hairs from a piece of biltong. Observe the type of box in which this is done. Next to it lies the rod by means of which hairs caked to the biltong are loosened. It lies on the sorting-board and specimen bottles are at hand.

of the meat or biltong may serve as a useful indicator. One recalls to mind the coarse texture of wildebeest biltong; but one can never be certain.

In any appreciable quantity of biltong, one will always find pieces to which hairs are adherent, especially when the biltong has been made hurriedly on a large scale and under field conditions. Sometimes even pieces of skin may be found attached to the biltong. It is really amazing to see the quantity of hair that one may find after a careful search, if necessary, with a handlens.

In crime detection hair identification has been a long established practice.(1) (2) More than a hundred years ago hair identification decided the issue in a murder case, and brought a murderer, who would otherwise have been discharged, to justice. In the case of biltong the question naturally arises to what extent the presence of hairs of a certain species is proof that the specimen in question was derived from that particular species. Absolute proof it can never be, and the court has to decide each case on its merits according to additional evidence. As hairs from game do not abound in such places in home or yard where beef biltong is normally prepared, it will not be an easy task for an accused to furnish satisfactory explanation for their presence; and it must be borne in mind that according to the Game Ordinance, innocence and not guilt must be proved.

On the identification of hairs themselves many publications exist,(1) (2) (3) but the hairs of our indigenous game have never been studied extensively. During 1951 and 1952 a collection of game hairs has been built up with the assistance of the personnel of the National

PHOTO 2.—Hairs are laid on the gelatine-coated slide to obtain imprints of the scale pattern of the hair cuticula.

FOTO 2.—Hare word op die gelatienbedekte plaatjie gelê om afdrukke van die skubpatroon van die haarvelletjie te kry.

'n huis voorkom waar biltong gesny word nie, sal dit vir 'n beskuldigde nie 'n maklike taak wees om die teenwoordigheid daarvan te verklaar nie. En onthou moet word dat volgens die Wildordonnansie die bewyslas op die beskuldigde rus, en nie by die kroon nie!

Oor die identifikasie van hare self bestaan daar heelwat geskrifte,(1) (2) (3) maar die hare van ons inheemse wild is nog nooit op omvattende wyse bestudeer nie. Gedurende 1951 en 1952 is met behulp van die Nasionale Dieretuin, die Transvaalse Museum, die Afdeling Fauna en Flora van die Provinsiale Administrasie en van goedgesinde jagters, wie die nodelose wilduitroeiing teen die bors gestuit het, 'n versameling van wildshare ('n „ trigoteek ") opgebou. In elke geval is die diersoort deur 'n deskundige geïdentifiseer en is hare van verskillende liggaamsdele versamel. Voorlopig is op die liggaamshare toegespits en waar nodig die maan- en sterthare ook gebruik. Van elke wildsboksoort, van die kameelperd, sebra en vlak- en bosvark, asook van al die huisdiere, is preparate gemaak wat as vergelykingstandaard sou dien.

Wanneer 'n besending gekonfiskeerde biltong ingestuur word vir identifikasie, word dit versigtig deurgesoek en 'n aantal biltonge gekies met oog op die teenwoordigheid van hare. Voorkeur word gegee aan biltong waaraan die hare vasgekoek sit, met ander woorde waar dit

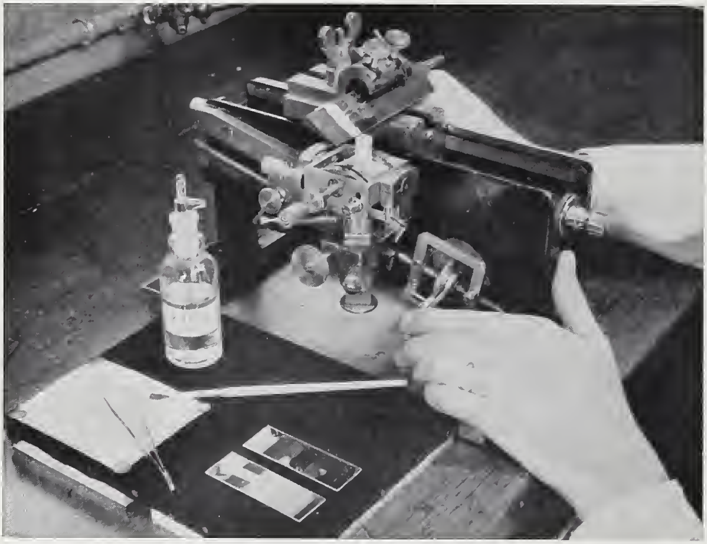


Foto 3.—Die sny van hare, wat in die was-pilaartjie ingesluit is, deur middel van 'n gly-mikrotoom. Die mes is hier net by die vierkantige pilaartjie. Klaar gesnyde skyfies lê op 'n ry oor die mes. Met die penseeltjie word die sneë op die glasies gelê, soos op die voorgrond links sigbaar is. Die Silol word gebruik om die was te verwyder.

Photo 3.—The sectioning of hairs enclosed in the wax column by means of a sliding microtome. The knife here almost touches the square column. Cut sections lie in a ribbon over the knife. By means of the brush the sections are placed on a slide, as can be seen in the left foreground. The Xylol is used to remove the wax.

Zoological Gardens, the Transvaal Museum, the Division of Fauna and Flora of the Provincial Administration, and hunters, who were averse to ruthless game destruction. In each case the species has been identified by an expert and hairs have been collected from various parts of the body. Provisionally attention has been concentrated on the body hairs, and the mane and tail-hairs have been used where necessary. Of each species of buck, giraffe, zebra, warthog and bushpig, as well as of all the domestic species, preparations have been made to serve as standards for comparison.

When a batch of confiscated biltong is sent for identification, it is carefully examined and a number of biltong pieces selected for the presence of hair. Preference is given to biltong to which hairs adhere firmly, in other words, where it is clear that the hairs have become attached during the cutting of the meat or shortly thereafter, whilst the biltong was still very wet.

Each piece thus selected is placed in a separate properly marked paper bag and described carefully one by one. All hairs are removed by means of a pair of forceps and/or a pointed or chisel-shaped rod. It has been found useful to use a plastic box with one side slanted and which is divided into two compartments; one white and one black. All the light hairs are removed over the black compartment and all the dark hairs over the white compartment, so that they remain clearly visible at all times and are not lost (see Photo 1). The hairs are

Photo 4.—Comparison of two preparations under the comparator microscope.

Foto 4.—Vergelyking van twee preparate onder die komparator-mikroskoop.

duidelik is dat die hare gedurende die sny van die vleis daaraan gekom het, of in elk geval kort daarna, terwyl die biltong nog baie nat was. As daar 'n stukkie vel aan 'n biltong gevind word, des te beter.

Elke biltong wat so uitgekies is, word apart in 'n behoorlik gemerkte papierkardoes gesit en dan een vir een noukeurig beskrywe. Al die hare word afgehaal met 'n tangetjie en/of 'n sterk skerppuntige of beitelvormige pen. Dit is nuttig gevind om 'n kassie van kunshars te gebruik waarvan die een sy skuins loop en wat in twee kompartemente verdeel is: een wit en een swart van kleur. Al die ligte hare word oor die swart kompartement verwyder en al die donker hare oor die wit kompartement, sodat hulle ten alle tye maklik sigbaar bly en nie verlore raak nie (sien Foto 1). Die hare word dan versamel op 'n sorteerplankie wat deels met swart ferweel en deels met wit kladpapier oortrek is, en dan geklassifiseer volgens lengte, dikte en kleur. 'n Beskrywing van die hare word dan aangeteken. Alhoewel die haarkleed se kleur as geheel 'n belangrike rol speel by die herkenning van diere, is dit verbasend hoe geweldig die kleur van enkele hare kan wissel. Daarby moet mens ook in gedagte hou dat bloed of stof of ander vuiligheid 'n haar se kleur baie anders kan laat lyk. Ook moet elke haar oor 'n swart en oor 'n wit agtergrond beskou word om 'n beter idee van sy kleur te kry.

Die hare van elke biltong word vervolgens in 'n flessie geplaas, of in meer as een flessie as daar met die blote oog duidelik herkenbare aparte groepe is, behoorlik toegekurk en met etikette voorsien. Teneinde verwarring te voorkom, word daar altyd net met één geval op 'n slag gewerk, en die laboratoriumregistrasienommer van die geval word op 'n duidelik sigbare plek in die laboratorium op 'n kaart aangebring.

Nou kom die taak om die hare voor te berei, 'n taak wat baie geduld en groot vaardigheid vereis. Die hare word fles vir fles skoongewas in water en dan in bensol. Glasplaatjies, van dieselfde tipe waarmee bloedsmere gemaak word, word bedek met 'n dun egalige lagie gesmelte gelatien wat deur toevoeging van 'n kleurstof (Nylblousulfaat) blou gekleur is. Sodra die gelatien 'n vereiste graad van hardheid verkry het, word die hare één vir één op die plaatjies geplaas, sodat al die hare van een fles op 'n bepaalde plaatjie kom (sien Foto 2). Die gelatien word oornag toegelaat om hard te word, en die hare die volgende môre versigtig met 'n naald en/of tang verwyder. Nou is die haar se „vinger"-afdruk geneem. Indien nodig word afdrukke van die sykante van die hare ook gemaak.

Verteenwoordigende hare of groepe hare word dan op 'n spesiale spanraampie in gestrekte toestand vasgeskroef en herhaalde male met kollodion geverf. Die haarbevattende kollodion-stafies word in chloroform opgehelder en hard gemaak, en vervolgens in gesmelte paraffienwas ingesluit. Na stolling van die was word die blokkie in die vorm van 'n reghoekige pilaartjie gesny en op 'n platform van 'n mikrotoom geplaas. In hierdie apparaat word 'n skerp lem op 'n glybaan oor die waspilaartjie beweeg, en skuif na elke beweging 'n vooraf bepaalde en op die apparaat gestelde afstand verby die lem (sien Foto 3). Op dié manier word die dikte van die aldus verkreë haarsnee bepaal. 'n Mens probeer so dun moontlik sny. Gewoonlik word dit gedoen op 'n dikte van 10 na 15μ (=0·010—0·015 mm.). Die sneë word op 'n glasplaatjie geplaas, die was afgesmelt en verwyder, en die preparaat bedek met 'n monteermedium (Kanada-balsem) met 'n dun dekglasie bo-oor. Die rante word met 'n kunshars (iso-butiel-metakrilaat) verseël

collected on a sorting board covered partly with black velvet and partly with white blotting paper and then classified according to length, thickness and colour. A description is recorded. Although the colour of the coat plays an important part in the identification of animals, it is surprising how much the colour of individual hairs may vary. It must be remembered that blood, dust or other dirt may influence the appearance of the colour to a great extent. Each hair must be examined over a black or white background to obtain an idea of its colour.

The hairs of each biltong arc placed in a bottle, or more than one if separate groups are distinguishable with the naked eye. To avoid confusion only one case is dealt with at a time and the laboratory registration number is displayed in a prominent place.

Now comes the task of preparation of the hairs, a task demanding much patience and competence. Bottle by bottle the hairs are washed, first in water then in benzol. Glass slides, of the same type as is used for making blood smears, are coated with a thin even layer of molten gelatine, coloured blue by means of addition of a stain (Nile Blue Sulphate). As soon as the gelatine has set to a requisite degree of hardness, the hairs are placed on the slide one by one, so that all the hairs from one bottle are on a certain slide. The gelatime is allowed to harden overnight and next morning the hairs are removed carefully by means of a needle and/or forceps. The same collecting box, as described above, is made use of. Now the "finger-prints" of the hairs have been taken. If required, imprints are also made from the sides of the hairs.

Representative hairs or groups of hairs are stretched in a special frame and coated several times with collodion. These collodion rods containing the hairs are cleared and hardened in chloroform and subsequently embedded in paraffin wax. After setting of the wax the block is cut in the shape of a rectangular pillar and placed on the platform of a microtome. In this apparatus a sharp blade on a slide moves over the wax column, advancing a previously adjusted distance with every movement (see Photo 3). In this way the thickness of the hair section is predetermined. The sections are cut as thin as possible: usually at about 10 to 15μ (=0·010—0·015 mm.). The sections are placed on a slide, the wax is melted away and removed, and the preparation covered with a mounting medium (Canada balsam) and a thin cover slip. The edges are sealed with a plastic material (iso-butyl-methacrylate) and the slide is properly labelled. Hairs which are too short to be mounted on the frame, are secured by means of forceps and in this way they are handled during the preparation for sectioning.

The rest of the hairs are removed from their collodion and paraffin wax sheath and mounted on a slide by means of Euparal, just as in the case of the sections. Those hairs, from which no sections have been prepared, are placed separately on a slide.

The preparations are examined under an ordinary miscroscope to get an impression of their shape and appearance, and then compared one by one with the standard preparations under the comparator mircoscope (see Photo 4). This microscope enables one to obtain a view of the separate objects next to one another in the same microscopic field, hence accurate comparison is possible.

en die plaatjie weer van die nodige etiket voorsien. Hare wat te kort is om in 'n spanraampie geplaas te word, word met behulp van 'n tangetjie vasgehou en op dié manier vir die maak van dwarssneë gehanteer.

Die oorgeblewe deel van die hare word uit die kollodion en paraffienwas-omhulsel verwyder en op 'n plaatjie met Euparal gemonteer nes die sneë. Dié hare waarvan geen sneë gemaak is, word apart op 'n plaatjie geplaas.

Nou word die preparate onder 'n gewone mikroskoop ondersoek om 'n indruk te kry van hulle vorm en voorkoms, en dan onder 'n komparator-mikroskoop één vir één met die standaard-preparate vergelyk (sien Foto 4). Deur middel van hierdie mikroskoop is dit moontlik om twee preparate langs mekaar in een mikroskopiese veld te sien te kry, en is akkurate vergelyking moontlik.

As 'n mens in gedagte hou dat hare in voorkoms kan wissel van die „ horing " van 'n renoster, die penne van 'n ystervark, die dik vesel van 'n olifanthaar, tot die fyn wol van 'n merino-skaap, is dit nie verbasingwekkend dat onder die mikroskoop hare, wat op die oog so weinig verskil, so 'n groot variasie in bouvorm vertoon nie. Van ons wildsbokke is die Klipsprinker (*Oreotragus oreotragus*) die enigste wat makroskopies onmiskenbare hare vertoon. Dis 'n baie dik, stywe vesel met 'n reëlmatige karteling, 'n room-kleur en, behalwe op die pens- en borshare, 'n donkerbruin band naby die sweepagtige punt (sien Foto 5). Die haar is, in teenstelling met sy dikte, baie lig, en drywe in bensol, terwyl ander hare sink.

Om die verdere beskrywing van hare onder die mikroskoop te kan volg, is dit noodsaaklik om die basiese bouvorm van 'n haar nader te betrag. Selfs met die blote oog, maar beter onder lae vergroting van 'n mikroskoop, kan gesien word dat 'n haar uit 'n wortel, skag en endpunt bestaan. Die skag se sye kan ewewydig wees, of die skag kan 'n verdikking ondergaan. 'n Haar is nie sommer 'n vesel nie, dis opgebou uit ontelbare klein verhoringde selletjies, wat saamgepak is om 'n langer of korter kolom te vorm. In die middel is die selle meesal

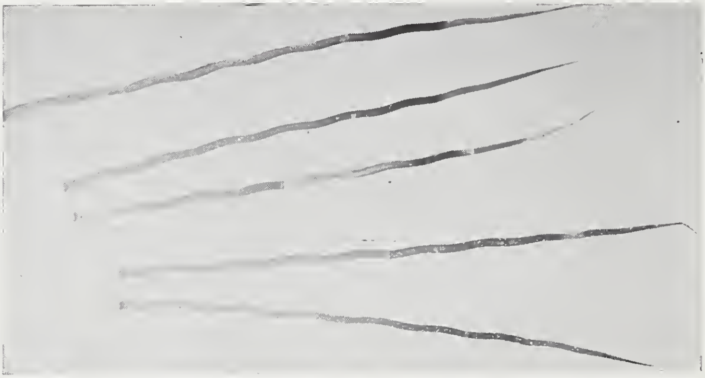


Foto 5.—Hare van die Klipspringer. (Die afdruk is effens donkerder gemaak om die nodige kontras te kry.)

Photo 5.—Hairs of the Klipspringer. (The print has been slightly darkened to obtain the necessary contrast.)

If one remembers that hairs may vary in appearance from the "horn" of a rhinoceros, the quills of a porcupine, the thick fibre of elephant hair, down to the fine wool of a merino sheep, then it occasions no surprise that hairs, which differ little one from the other by naked eye examination, should exhibit such a wide variation in structure. Of our game the Klipspringer (*Oreotragus oreotragus*) is the only one whose hair macroscopically is unmistakably distinct. In consists of very thick, stiff hair fibres, with regular waviness, a creamy colour and, except for belly and chest hairs, a dark brown band near the whip-like tip (see Photo 5). The hair is very light, in contrast to its thickness, and floats in benzol whilst other hairs sink.

To be able to follow the description of hairs as seen under the microscope, it is necessary to consider the basic structure thereof more closely. Even with the naked eye, but better still under the low magnification of a microscope, it can be observed that a hair consists of a root, shaft and tip. The shaft may have parallel sides, or it may undergo a thickening. A hair is not just a fibre, it is built up out of innummerable small cornified cells, which are packed together to form a shorter or longer column. In the middle the cells are mainly large and hollow, packed together to form discs, and contain air: the medulla of the hair. The air-containing medulla appears black when viewed by means of transmitted light, because the air deflects the impinging beams of light.

Around the medulla lies the denser cortex. Here the pigment granules are found: fine, coarse, thinly distributed or clumped together, at times so densely that the whole hair appears pitch black and no differentiation between medulla and cortex is possible. The outer cell layer—the cuticula—consists of flat, cornified cells packed together like fish scales or tiles on a roof. Their edges project and consequently enable one to make impressions in gelatine. The pattern thus produced is rather characteristic. It has to be kept in mind, however, that the pattern varies from root to shaft, to tip, and that older hairs deviate from the basic pattern due to wear and tear.

On one and the same animal's body various types of hairs may be found, types which often may be distinguished by the naked eye and according to their position on the body:—

(1) *Ornamental Hairs.*—Long, thick hairs forming mane, tail and sometimes adorning forehead and dewlap.
(2) *Tactile Hairs.*—Long stiff hairs which have well developed nerve-endings associated with their roots. By giving timely warning they serve to protect certain parts of the body and thereby the body as a whole. Whiskers and eye-brows of some animals serve as examples.
(3) *Guard Hairs.*—Long, relatively thick body hairs, often projecting above the other hairs forming the pelt.
(4) *Contour Hairs.*—Body hairs which are slightly thinner than the foregoing and which, in their most typical form, show a thickening of the shaft present at a varying distance from the root. In typical cases the body hairs become shorter and relatively thicker on the face, paws and groin.
(5) *Downy Hairs.*—Fine and relatively short hairs which tend to be curly. The medulla is poorly developed and their cuticular pattern tends to be wide.
(6) *Wool.*

groot en hol, saamgepak in skywe, en bevat lug—die medulla of murg van die haar. Die lugbevattende medulla vertoon swart as 'n mens die hele haar op sy kant onder die mikroskoop beskou, omdat die lug die deurvallende ligstrale deflekteer.

Om die medulla lê die digtere „cortex" of skors. Hierin kom die kleurstofkorreltjies voor: fyn, grof, ylversprei, in klompies saamgepak, of so dig dat die hele haar pikswart vertoon en onderskeid tussen skors en murg moeilik of gladnie moontlik is nie. Die buitenste sellaag—die haarvelletjie of cuticula—bestaan uit plat, verhoringde selle wat soos visskubbe of dakteëls teenmekaar gepak is. Hulle randjies steek uit, en sodoende kan mens afdrukke daarvan in gelatien maak. Die patroon wat die haarvelletjie maak is nogal kenmerkend. Daar moet egter rekening gehou word met die feit dat die patroon naby die wortel, middel van die skag en endpunt wissel, en dat ouer hare weens slytasie ook afwyk van die basiese patroon.

Op een en dieselfde dier se liggaam sal mens verskillende klasse van hare kry, klasse wat dikwels met die blote oog en volgens hulle posisie op die liggaam herkenbaar is:—

(1) *Sierhare.*—Lang, dik hare wat die maan of pronk, stert en soms die voorkop en keelvel versier.

(2) *Tashare.*—Lang, stywe hare wat om hul wortels sterk ontwikkelde senu-endpunte het. Hulle doel is om deur betydse waarskuwing sekere liggaamsdele, en so die dier, te beskerm. Die „snor"-hare om die mond en die lang „winkbrou"-hare by baie diere is 'n voorbeeld hiervan.

(3) *Skermhare* (Duits: „Leithaare").—Lang, betreklike dik lyfhare wat dikwels bo die gewone haarkleed uitstaan.

(4) *Kontoerhare* (Duits: „Grannenhaare").—Lyfhare wat effens dunner as die voorgaande is en wat, in hul mees tipiese vorm, 'n verdikking of versterking van die skag vertoon wat op wisselende afstande bo die wortel voorkom. Op die gesig, pote en in die lies word die lyfhare in tipiese gevalle baie korter en relatief dikker.

(5) *Donshare* (Duits: „Flaumhaare").—Fyn en betreklike kort hare wat neig om krullerig te wees. Hulle medulla is swak ontwikkel en hulle skubpatroon neig om wyd te wees.

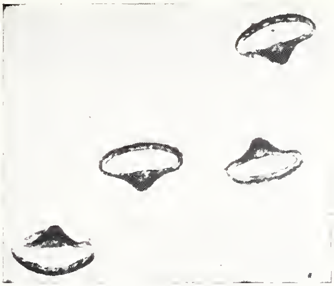
(6) *Wol.*

Skerm- en kontoerhare wys heelwat oorgangsvorms, terwyl donshare weer 'n oorgangstipe tussen gewone lyfhare en wol voorstel.

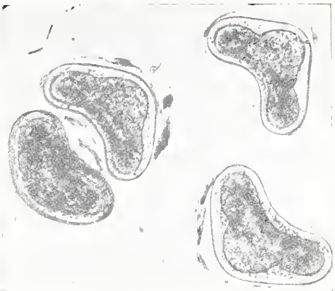
Ongetwyfeld behoort heelwat interessante en nuttige inligting verkry te kan word deur bestudering van die voorkoms en verspreiding van al die haarsoorte by elke spesie van ons wild, asook die wisseling na gelang van geslag, seisoen en ouderdom, maar dit is op sigselwe 'n reusetaak. Tot dusver is, met oog op dier-identifikasie, die aandag hoofsaaklik op die lyfhare [Nos. (3) en (4) in bogenoemde klassifikasie] toegespits.

'n Paar interessante voorkomste van sulke lyfhare verdien melding.

Die haardwarssneë van ons wildsboksoorte is nie almal rond of selfs ovaal nie. Die Rooibok (*Aepyceros melampus*) het 'n uiters kenmerkende haardwarssnee: dis sterk ovaal, met een kant afgeplat, en hierdie kant besit 'n versterkende rif waarin die kleurstof die meeste gekonsentreer is. Die murg is baie wyd (sien Foto 6). Van ons Suid-Afrikaanse boksoorte is dit die enigste van sy soort en maak dit eenvoudig om tipiese Rooibokhare met absolute sekerheid uit te ken. By



PHOTO/FOTO 6.



PHOTO/FOTO 7.

PHOTO 6.—Cross-section of Impala hair. Every photo from No. 6 to No. 25, inclusive, has been taken at the same magnification.

FOTO 6.—Deursnee van Rooibokhare. Elke foto vanaf no. 6 tot en met no. 25 is met dieselfde vergroting geneem.

PHOTO 7.—Cross-section of Cape Oryx hair.

FOTO 7.—Deursnee van Gemsbokhare.

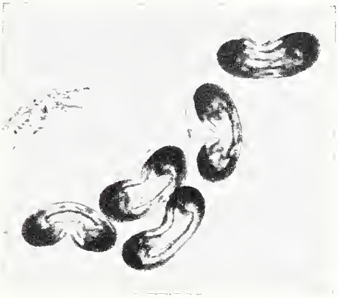


PHOTO 8.—Cross-section of Blue Wildebeest hair.

FOTO 8.—Deursnee van Blouwildebeeshare.

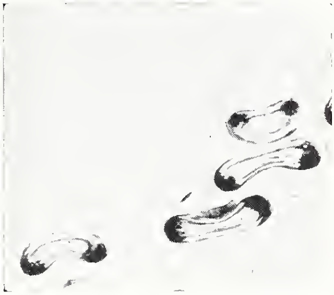


PHOTO 9 —Cross-section of Tsessebe hair.

FOTO 9.—Deursnee van Basterhartebeeshare.

PHOTO 10.—Cross-section of Black Wildebeest hair.

FOTO 10.—Deursnee van Swartwildebeeshare.

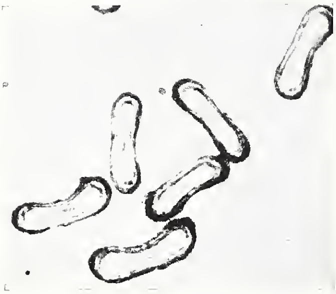


PHOTO 11.—Cross-section of Hartebeest hair.

FOTO 11.—Deursnee van Hartebeeshare.

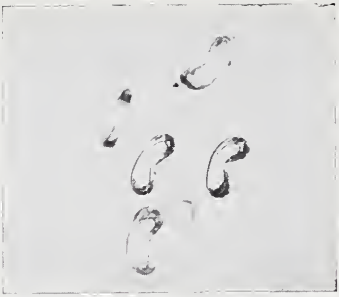


FOTO 12.—Deursnee van Blesbokhare.
PHOTO 12.—Cross-section of Blesbuck hair.

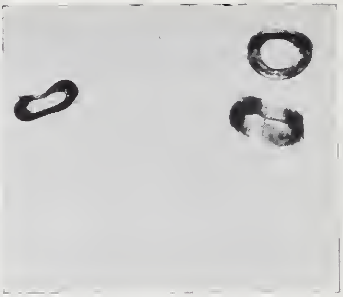


FOTO 13.—Deursnee van Bontebokhare.
PHOTO 13.—Cross-section of Bontebok hair.

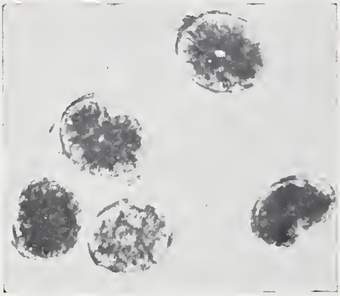


FOTO 14.—Deursnee van Buffelhare.

PHOTO 14.—Cross-section of Buffalo hair.

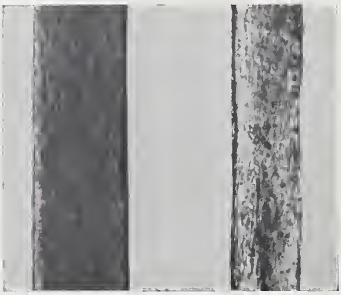


FOTO 15.—Heel gemonteerde Buffelhare.
PHOTO 15.—Whole mount of Buffalo hair.

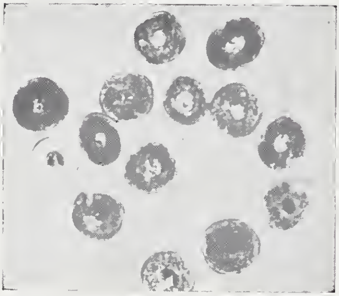


FOTO 16.—Deursnee van Koedoehare.
PHOTO 16.—Cross-section of Kudu hair.

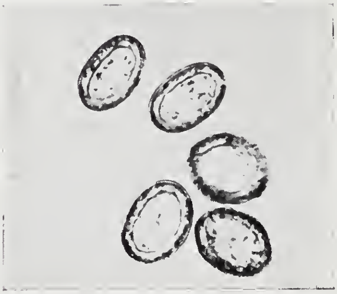


FOTO 17.—Deursnee van Njalahare.
PHOTO 17.—Cross-section of Nyala hair.

Guard and contour hairs show many intermediary forms, whilst downy hairs represent an intermediate form between ordinary body hairs and wool.

Undoubtedly a great deal of useful and interesting information would accrue from the study of occurrence and distribution of all the types of hair in each species of our game, as well as the variation according to sex, season and age, but that in itself would be a gigantic task. With the emphasis on species identification, attention thus far has been concentrated mainly on the body hairs [Nos. (3) and (4) in the above classification].

A few interesting appearances of such body hairs deserve mention.

The cross-sections of hairs from our species of game are not all round or even oval. The Impala (*Aepyceros melampus*) has a most characteristic cross-sectional appearance: it is markedly oval and one side is flattened. This side has a buttress-like supporting ridge in which the pigment is mostly concentrated. The medulla is very wide (see Photo 6). It is unique amongst our South African species of game and it thus becomes a simple matter to recognise typical Impala hairs with absolute certainty. Those that are not entirely unpigmented show this ridge as a reddish brown streak in mounted preparations wherever air in the medulla has been displaced (see Photo 19). If the impression has been made from the ridged side, a very distinct groove is left (see Photo 23). Cape Oryx (*Oryx gazella*) hair has a triangular cross-section with rounded edges, one side being depressed. The medulla has an almost clover-leaf outline. (See Photo 7.) The depressed side forms a longitudinal ridge, which may often be seen by the naked eye because of the thickness of the hair.

The Wildebeest group (sub-family *Alcelaphinae*) all show a bean-shaped cross-section, but differences appear on careful comparison. The Blue Wildebeest (*Gorgon taurinus*) (Photo 8) reveals a thick cortex and typical " reinforcements " at the sides. In this again pigment is concentrated. Next in decreasing order of coarseness of structure as shown on cross-section come the Tsessebe (*Damaliscus lunatus*) (Photo 9), the Black Wildebeest (*Connochaetes gnu*) (Photo 10), then the Hartebeest (*Alcelaphus caama*) with its more delicately shaped flatter and broader hairs (Photo 11). The Blesbuck (*Damaliscus albifrons*) has a much thinner and finer hair of similar fashion (Photo 12), whilst the Bontebok (*Damaliscus pygargus*) has an atypical hair shape, despite its close similarity to the foregoing (Photo 13).

The Buffalo (*Syncerus caffer*) has an almost imperceptible medulla (Photos 14 and 15).

Upon comparing cross-sections of hairs from three closely allied types such as Kudu (*Strepsiceros strepsiceros*), Nyala (*Nyala angasi*) and Bushbuck (*Tragelaphus scriptus*), quite profound differences nevertheless become apparent, as shown by Photos 16, 17 and 18.

The whole mounts of hairs present the hairs in side view. Those hairs with a peculiar shape on cross-section may or may not reveal these in such a side view, depending on the angle from which they are viewed. Hence cross-sections are indispensable for an examination.

Rooibokhare wat nie spierwit is nie, kan hierdie rif in die gemonteerde preparaat as 'n rooi-bruin streep gesien word in plekke waar die lug uit die murg verplaas is (sien Foto 19). As die afdruk van dié kant met die rif gemaak is, staan dit duidelik uit (sien Foto 23). Gemsbok (*Oryx gazella*) se haardwarssneë is weer driehoekig, met ronde rande en een sy effens ingeduik. Die murg het amper die fatsoen van 'n klawerblaar (sien Foto 7). Die ingeduikte kant vorm 'n oorlangsverlopende rif wat, omrede die dikte van die haar, dikwels met die blote oog waarneembaar is.

Die Wildebeesgroep (onder-familie *Alcelaphinae*) wys almal 'n boontjie-vormige dwarssnee, maar as mens hulle versigtig vergelyk, blyk daar tog duidelike verskille te wees. Die Blouwildebees (*Gorgon taurinus*) (Foto 8) toon 'n haar met 'n dik skors en tipiese „versterkings" aan die kante. Hierin is weer die pigment gekonsentreer. Die volgende haarsoort in afnemende volgorde van grofheid van bou soos op dwarssnee vertoon, is die Basterhartebees (*Damaliscus lunatus*) (Foto 9), dan kom die Swartwildebees (*Connochaetes gnu*) (Foto 10), dan die Hartebees (*Alcelapha caama*) met sy meer sierlik gevormde, platter en breër hare (Foto 11). Die Blesbok (*Damaliscus albifrons*) het 'n heelwat dunner en fyner haar van dieselfde fatsoen (Foto 12), terwyl die Bontebok (*Damaliscus pygargus*) nieteenstaande sy algemene voorkoms so naverwant aan die Blesbok is, weer 'n atipiese haarvorm het (Foto 13).

Die Buffel (*Syncerus caffer*) het 'n skaars herkenbare medulla (Foto's 14 en 15).

Neem 'n mens byvoorbeeld drie naverwante tipes soos die Koedoe (*Strepsiceros strepsiceros*), die Njala (*Nyala angasi*) en die Bosbok (*Tragelaphus scriptus*) dan word tog uiteenlopende beelde van die hare verkry, soos Foto's 16, 17 en 18 wys.

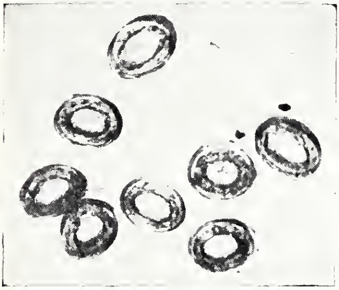
Die heel gemonteerde hare gee 'n sy-aansig van die haar. Dié hare met 'n eienaardige fatsoen op dwarssnee, vertoon dit meesal, maar nie altyd, ook in die sy-aansig, afhangende van watter hoek die haar beskou word. Daarom is dwarssneë onontbeerlik vir 'n ondersoek. In die totaal-preparaat kan 'n mens weer die verhouding van murg tot skors bestudeer, maar hierdie keer oor die hele lengte van die haar. Verder kan 'n beter indruk verkry word van die verspreiding van kleurstofkorreltjies, indien enige (Foto 19), en van die manier waarop die haar se bou wissel van wortel tot by sy punt. In geval van kort hare kan waargeneem word of die haar werklik so kort is, en of dit 'n lang haar was waarvan wortel en/of punt weggesny of afgebreek is. In die geval van deurgesnyde hare dring dikwels van die monteermedium by die medulla in, en kry mens dan 'n begrip van die voorkoms van murgskywe (Foto's 19 en 20). Somtyds kan van die heel-montering alleen betroubare inligting verkry word (sien bv. vergelyking tussen Koedoe- en Beeshare—Foto's 20 en 21).

Haarafdrukke, alhoewel op sigselwe nie altyd voldoende vir identifikasie nie, is tog 'n groot hulp om op kritieke punte deurslag te gee. Soms word die eienaardigheid van haarbou ook in die afdruk weergegee en nie alleen die skubpatroon van die haarvelletjie nie (sien Foto's 22 en 23). Buffelhare se skubpatroon is so fyn dat dit uiters moeilik gaan om 'n afdruk te kry (sien Foto 24). Koedoehare gee weer 'n mooi reëlmatige, betreklik wydgeskubde patroon (Foto 25).

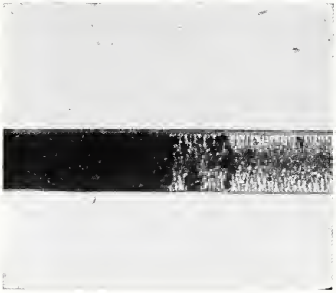
In such a total preparation one may study the relation of medulla to cortex once again but now over the whole length of the hair. A better impression may be gained of the pigment distribution, if any (see Photo 19), and of the way in which the hair's structure varies from root to tip. In the case of short hairs one may observe whether the hair is really so short, or whether it is a long hair of which root and/or tip has been cut or broken off. At cut ends of hairs the mounting medium often penetrates the medulla and one then gains an impression of the shape of the medullary discs (Photos 19 and 20). Sometimes whole mounts alone may yield reliable information, *vide* the comparison of Kudu and ox hairs (Photos 20 and 21).

Hair impressions, although as such not always adequate for identification purposes, are of great aid to give finality on critical issues. Sometimes the peculiarity of hair structure is also shown in the impression and not only the pattern of the scales of the cuticula (see Photos 22 and 23). Buffalo hairs have such a fine cuticular pattern that it becomes exceptionally difficult to obtain an impression at all (see Photo 24). Kudu hairs yield a beautifully regular, relatively wide-webbed pattern (Photo 25).

By combining these three methods, the similarity (or otherwise) of a set of unknown hairs to a known set may be determined with accuracy. Where hairs have one or more absolutely typical characteristics, such as Impala hair, for example, identification is easy and in the examiner's report it is mentioned that such hairs are *typical* for a certain species. In all other cases exhaustive comparisons have to be made.



PHOTO/FOTO 18.



PHOTO/FOTO 19.

PHOTO 18.—Cross-section of Bush-buck hair.

FOTO 18.—Deursnee van Bosbokhare.

PHOTO 19.—Whole mount of Impala hair. Note the wide medulla, the narrow cortex and the appearance of medullary discs (right) where the air has been displaced from the medulla which no longer has the black appearance as seen on the left. The pigmented ridge can also be seen clearly in the transparent part on the left.

FOTO 19.—Heel gemonteerde Rooibokhaar. Let op die wye murg, die baie nou skors en die voorkoms van die murgskywe (regs) waar die lug uit die medulla verplaas is en dit dus nie meer swart voorkom nie, soos in die linkerdeel van die haar. In die deurskynende regterdeel kan ook die gepigmenteerde rif duidelik gesien word.

Deur hierdie drie metodes van ondersoek saam te vat, kan met sekerheid die ooreenkoms al dan nie van 'n onbekende reeks hare met 'n bekende reeks vasgestel word. Waar hare een of meer absoluut tipiese kenmerke het soos bv. die Rooibokhaar, is uitkenning baie maklik, en word in die ondersoeker se verslag ook vermeld dat die haar of hare *tipies* is vir die betrokke diersoort. In al die ander gevalle moet van noukeurige vergelyking gebruikgemaak word.

Nes op al die ander gebiede van die biologie, is daar die probleem van normale biologiese variasie, soos van Foto's 7, 9, 10 en 13 duidelik afgelei kan word. Daarom is dit in hierdie gevalle wenslik, so nie noodsaaklik nie, dat meer as een haar vir vergelyking beskikbaar is. Die ondersoeker kry dan 'n beter geleentheid om hare te vind wat absoluut identies is met die standaard, en moet dit dan as sodanig in sy verslag vermeld. Waar hare gevind word wat in geringe mate van die standaard afwyk, hang die uitslag van die ondersoeker se ervaring en oordeel af. Deur die term „vergelykbaar" in sy verslag te gebruik, gee die ondersoeker te kenne dat daar nie absolute identiteit gevind is nie, maar dat die onbekende haarmonster na sy *persoonlike* mening aan die diersoort behoort wat hy dan noem. In die groep van „vergelykbare" monsters, val ook dié hare wat deur beskadiging of onvolledigheid die vasstelling van absolute identiteit onmoontlik maak.

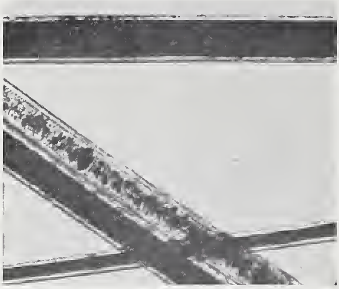


FOTO 20.—Koedoehare soos in 'n heel gemonteerde preparaat gesien.
PHOTO 20.—Kudu hair as seen in a whole mount preparation.

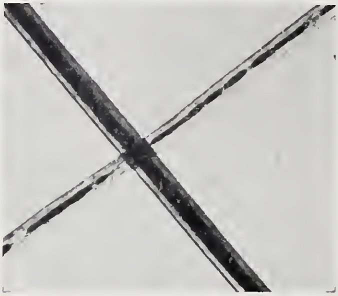


FOTO 21.—Beeshare ter vergelyking met voorgaande.
PHOTO 21.—Ox hair for comparison with the foregoing.

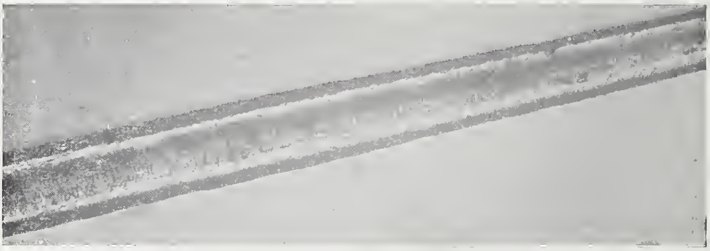


FOTO 22.—Afdruk van 'n Blouwildebeeshaar.

PHOTO 22.—Imprint of a Blue Wildebeest hair.

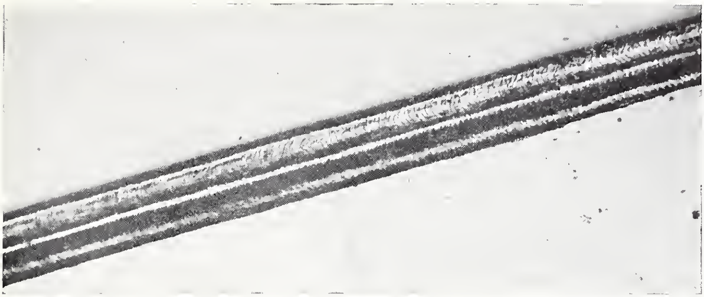


PHOTO 23.—Imprint of an Impala hair.

FOTO 23.—Afdruk van 'n Rooibokhaar.

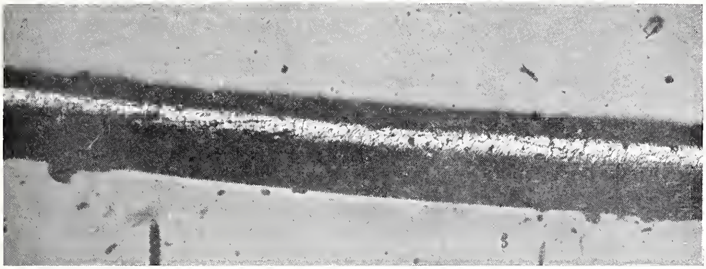


PHOTO 24.—Imprint of a Buffalo hair.

FOTO 24.—Afdruk van 'n Buffelhaar.

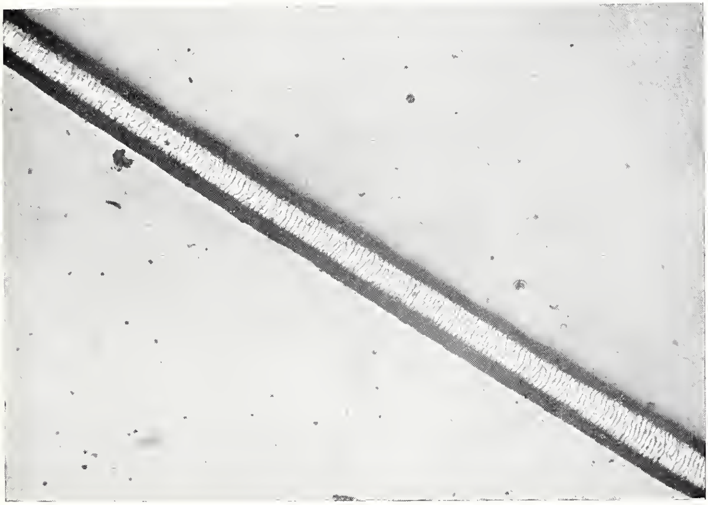


PHOTO 25.—Imprint of a Kudu hair.

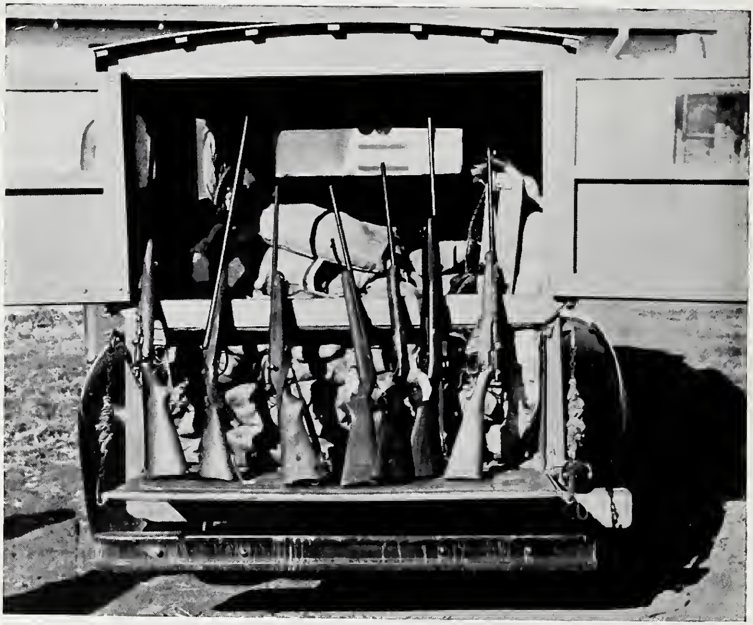
FOTO 25.—Afdruk van 'n Koedoehaar.

Hare wat te beskadig is, of waarvan die voorkoms, selfs na volledige en noukeurige vergelyking, nog twyfel by die ondersoeker wek, moet as „nie-identifiseerbaar" of „nie-geïdentifiseer" bestempel word. Word die woord „nie-identifiseerbaar" gebruik, dan beteken dit dat die ondersoeker elke haar nagegaan het. As daar baie hare is, sodat die ondersoek buite alle tydsperke gerek sou word, hoef net 'n groot deel ondersoek te word. Dan word dié hare wat nie ondersoek is nie, sowel as dié wat nie identifiseerbaar is nie, eenvoudigheidshalwe saamgevat en as „nie geïdentifiseer" bestempel. In hierdie groep val ook donshare en wol, en dié sier- en tashare wat op die huidige tydstip nog nie deel uitmaak van die standaard-versameling nie.

Deur gebruik te maak van hierdie vier kategorieë, word die hof beter in staat gestel om sy oordeel oor die waarde van die verslag te vel.

Deur die toepassing van hierdie erkende en betreklik eenvoudige beginsels word 'n sterk wapen in die hande geplaas van diegene wat belas is met die beskerming en bewaring van ons inheemse fauna.

Met dank word die verskaffing van fasiliteite vir die navorsingswerk en goedkeuring vir publikasie van hierdie artikel deur die Direkteur van Veeartsenydiens erken. Die tegnieke is uitgevoer deur mnr. J. H. Dreyer, B.Sc., Assistent-professionele beampte, en mnr. S. J. Kruger, Tegniese Assistent te Onderstepoort.



Gekonfiskeer van biltongjagters.
Confiscated from Biltong Hunters.

(Foto/Photo: T. J. Steyn)

Just as in all other branches of biology, there is the problem of normal biological variation, as may be inferred clearly from Photos 7, 9, 10 and 13. In these cases it is, therefore, preferable, if not absolutely necessary, that more than one hair is available for comparison. The examiner then has a better opportunity to find hairs completely identical with the standard; this must then be mentioned as such in his report. Where hairs are found which deviate slightly from the standard, the result depends upon the examiner's experience and judgment. By using the term " comparable " in his report the examiner indicates that no absolute similarity has been found, but that according to his *personal* opinion the unknown specimen belongs to the species named by him. In the group of " comparable " specimens those hairs are also classified which are so damaged or incomplete that establishing of absolute identity is impossible.

Hairs which are too damaged or of which the appearance leaves doubt even after careful and exhaustive comparison, are indicated as " non-identifiable " or " not identified ". The term " non-identifiable " indicates that every hair has been examined. Where there are many hairs so that the examination would have extended beyond all feasible time limits, only a greater part need be examined. Those hairs which then have not been examined as well as the " non-identifiable " ones are simply classified together as " not identified ". In this group downy hairs, wool and those ornamental and tactile hairs are grouped which as yet do not form part of the type collection.

By making use of these four categories the court is enabled to form a clearer opinion of the value of the report.

Through application of these recognized and relatively simple principles a powerful weapon is placed in the hands of those charged with the duty of protection and conservation of our indigenous fauna.

The granting of facilities for research work and the assent to publication of this article by the Director of Veterinary Services is hereby gratefully acknowledged. The techniques have been executed by Mr. J. H. Dreyer, B.Sc., assistant professional officer, and Mr. S. J. Kruger, technical assistant at Onderstepoort.

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Oor die gedrag van ’n trop van VYF GEVLEKTE HIËNAS

deur dr. R. Bigalke

DIT is bekend dat die gevlekte hiëna (*Crocuta crocuta*) die gewoonte het om in sekere areas te ontlas, areas wat paslik „latrine-areas” deur Matthews(¹) genoem word. Volgens hierdie outeur soek die diere waarskynlik nie doelbewus na hierdie areas nie, maar kom hul toevallig daarop af word hulle geprikkel om te ontlas. Sulke „latrine-areas” is by Pretoriuskop en in ander dele van die Nasionale Kruger-Wildtuin te sien.

Die geluk het my te beurt geval om ’n trop van vyf gevlekte hiënas op die oggend van 1 Julie 1952 by so ’n „latrine-area” aan te tref. Op die pad vanaf Skukuza na die Skurukwanseekoeigat in die Sabierivier is die groepie hiënas enige myle oos van die seekoeigat, aan die suidelike oewer van die Sabie teëgekom. Vier lede van die trop was by ’n „latrine-area” op die suidelike oewer van die rivier, regs van die pad, terwyl die vyfde, klaarblyklik ’n jong dier, hom aan die teenoorgestelde kant van die

(Foto/Photo: Dick Wolff.)

Gevlekte hiëna (*Crocuta crocuta*) in die Nasionale Kruger-wildtuin.

Spotted Hyaena (*Crocuta crocuta*) in the Kruger National Park.

A note on the behavior of a group of FIVE SPOTTED HYAENAS

by Dr. R. Bigalke

IT is known that the Spotted hyaena (*Crocuta crocuta*) has the habit of defaecating in areas which Matthews(¹) aptly names "latrine areas". According to this author, the animals probably do not consciously look for these areas, but when they come across them they are stimulated to defaecate. Such latrine areas may be seen at Pretorius Kop and other parts of the Kruger National Park.

On the forenoon of the 1st July, 1952, I had the good fortune of coming upon a troop of five Spotted hyaenas at such a latrine area. On the way from Skukuza to the Skurukwan Hippo Pool on the Sabie River, five Spotted hyaenas were encountered some miles east of the pool on the southern bank of the Sabie River. Four of the animals were in the latrine area on the southern bank of the river (right-hand side of the road), and the fifth, apparently a young specimen, was on the opposite side of the road. It seems that a car just ahead had cut off the fifth animal from the other four and that it was then afraid to cross over to the others.

The four hyaenas were close to my car, but unfortunately the sexes could not be established. It is quite certain, however, that one of the four was a male. The animals were very agitated. They moved about rapidly but silently and took little notice of the two motor cars. There was much sniffing and smelling of the area and the grass and objects on it. It was clear that the agitated behaviour of the four animals was the result of olfactory stimuli.

One of the four animals scratched actively for a few minutes at the base of a tuft of dry grass, another (it seemed to be a lactating female) lay down on its belly and smelt the spot in front of it. A male was seen to evert the rectum in the defaecating position and to smear some substance on to the top of a single dry grass stalk about the height of the anus.

In his description of the breeding of the Spotted hyaena in the Zoological Garden of Leipzig, Schneider(²) refers to the extrusion of the rectum and surmises that this is associated with the animal's sexual behaviour. He states that he has often seen both the adult male and female go to the same spot (in most cases the door-sill of their cage) and smell this. They then assumed the defaecating attitude and on straining, the terminal part of the rectum was extruded; this was about five centimetres long, of a reddish colour and mostly covered with a yellowish substance. According to Schneider the animal does not defaecate on such occasions, and I am able to confirm this from the instance of the male cited above. Schneider states that when the animal does defaecate the rectum is not everted.(²)

Unfortunately circumstances did not permit me to observe the behaviour of the animals for as long as was desirable.

pad bevind het. Blykbaar is laasgenoemde individu deur die motor voor myne van die res van die trop afgekeer en was toe bang om die pad na die ander oor te steek.

Alhoewel die vier hiënas naby my motor was, kon die geslagte nie vasgestel word nie. Nogtans is dit seker dat een van hulle 'n mannetjie was. Die diere was baie opgewonde en het vinnig dog geluidloos heen en weer beweeg sonder om veel notisie van die twee motors te neem. Die „ latrine-area ", met die bossies en ander voorwerpe daarop, is goed deursnuffel en beruik en dit was duidelik dat die opgewonde gedrag van die vier diere veroorsaak is deur reukprikkels.

Een van die vier hiënas het vinnig aan die basis van 'n droë graspol gekrap terwyl 'n ander (wat na 'n wyfie in melk gelyk het) op haar maag gelê en 'n plekkie voor haar beruik het. Daar is opgemerk dat 'n mannetjie sy rectum in die ontlastingsposisie uitstulp en 'n sekere stof aan die punt van 'n enkele droë grashalm afvee.

Schneider(²) verwys in sy beskrywing van die voortplanting van die gevlekte hiëna in die Leipzig-dieretuin na die uitstulping van die rectum en spreek die vermoede uit dat dit in verband met die geslagslewe van die dier staan. Hy meld verder dat hy dikwels gemerk het dat die volwasse mannetjie en wyfie na dieselfde plek (gewoonlik die drumpel van hul hok) gaan en daaraan ruik. Hierop neem hul die ontlastingshouding aan en die terminale gedeelte van die rectum word uitgestulp. Die terminale gedeelte van die rectum was omtrent vyf centimeter lank, rooierig van kleur en vir sy grootste gedeelte met 'n gelerige stof bedek. Volgens Schneider ontlas die dier nie by hierdie geleentheid nie, 'n stelling wat deur my eie waarnemings van die mannetjie hierbo genoem, bevestig word. Schneider merk verder op dat die rectum nie by ontlasting uitgestulp word nie.

Ongelukkig het omstandighede dit nie toegelaat om die gedrag van die diere vir so 'n lang tyd as wat nodig was, waar te neem nie.

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Leopard.
Luiperd.

(Foto/Photo: Dick Wolff)

DIE ROOIJAKKALS

en sy rol in die ewewig in die natuur

deur N. J. v. d. Merwe, D.Sc.

(Afdeling Fauna en Flora)

VOOR die koms van die beskawing in Suidelike Arfika, het die rooijakkals (*Thos mesomelas*) 'n baie nuttige rol gespeel in daardie mate van ewewig wat in die natuur bestaan het. Hierdie stelling vind sy bewyse vandag in gebiede soos parke, reserwes en skietplase, waar die staat, provinsiale administrasies of private eienaars die oorspronklike natuur nog getrou bewaar.

Hoewel die rooijakkals reeds van ouds nie die versoeking om skaap te vang kon weerstaan nie, is dit duidelik uit die getuienis van baie boere, dat dit maar in die afgelope 40-50 jaar 'n probleem geword het, wat nou dreig om 'n plaag te word.

In sy oorspronklike omgewing is die rooijakkals 'n aasvreter en volgens die geskrifte was hy dit altyd. Hy en diere soos die hiëna, rooimeerkatte, silwerjakkals, aasvoëls, e.a., het die velde van aas skoongehou en sodoende die moontlikheid van ander plae afgeweer.

Die rooijakkals het 'n belangrike rol gespeel in die evolusie van ons grotere wildsoorte, deur alle siekes, swakkes en verminktes te vang. Saam met die grotere roofdiere soos leeus, luiperds, jagluiperds, ens., het hy gehelp om die swakkere individue te verwyder en sodoende 'n mate van natuurlike seleksie te bewerkstellig. Ook deur die verwydering van die siekes is ernstige epidemies moontlik voorkom.

In die beheer van skadelike knaagdiere soos rotte, muise, hase, meerkatte, asook dassies, ens., het hy geen geringe rol gespeel nie. Saam met silwer- en bakoorjakkalse het hulle die moontlikheid van sulke plae afgeweer.

Insekte soos sprinkane en groot kewers word wel deur die rooijakkals geëet, maar hy kan nie juis as 'n effektiewe beheermaatreël in hierdie opsig beskryf word nie; hy moet tog as 'n nuttige skakel in die groep natuurlike vyande van die insekte beskou word, wat gesamentlik plae in bedwang kan hou.

Die rooijakkals is een van die belangrikste afweermiddels teen oorbevolking onder die ander soorte jakkalse, aangesien hy selfs volwassenes onder hulle sal aanval en vernietig.

Hoe gering ook al, speel hy ook 'n rol in die verspreiding van plante deurdat sade wat aan sy pels bly vassteek op ander plekke afgeskuur word. Verskeie soorte veldvrugte en -bessies word deur die rooijakkals gevreet en die pitte word saam met die ontlasting op ander plekke gelaat.

In teenstelling met bogenoemde, vind ons ook dat die rooijakkals se getalle in die natuurstaat deur siektes en vyande soos luiperds, ens., in bedwang gehou word en geoordeel na sy sluheid en ander kenmerke is sy bestaan glad nie 'n gemaklike nie.

THE BLACK-BACKED JACKAL and natural balance

by N. J. v. d. Merwe, D.Sc.

(Fauna and Flora Section)

PRIOR to the dawn of civilization in Southern Africa, the Black-backed jackal (*Thos mesomelas*) played an important role in that degree of balance that did exist in nature. Proof of such a statement may at the present time be observed in parks, reserves and on shooting farms, where the government, provincial administrations and private owners still conserve the original conditions.

Although the Black-backed jackal could never resist the temptation to kill sheep, it is evident from the testimony of many farmers that it is only during the last 40-50 years that this habit is threatening to become a major problem.

In its natural milieu the Black-backed jackal is a scavenger, and according to different biologists it has always been such. This and other animals, e.g. the hyena, Red meercat, Silver jackal, vulture, etc., removed all carrion from the veld, thereby preventing the spreading of disease.

It played an important role in the evolution of the present larger game species by killing off all sick, weak and mutilated members. Together with the larger predators such as the lion, leopard and cheetah, it helped to remove the weaklings and in such a way established a certain degree of natural selection. The removal of the sick animals also prevented the spreading of epidemic diseases.

The role played by the Black-backed jackal in the control of vermin, such as rats, mice, meercats, springhares, rock-rabbits, etc., cannot be considered negligible. Together with Silver and Large-eared foxes it prevented rapid multiplication of these animals as well as the possibilities of sporadic outbreaks of such pests.

Insects, such as locusts and larger beetles are devoured by the Black-backed jackal, but the latter cannot be described as an effective means of control. However, it must be considered a useful member of the group of natural enemies, which together keep insects in control.

The Black-backed jackal acts as the most important check against overpopulation amongst other types of jackals as well as foxes, especially because it often overpowers and kills even the adults of these species.

Although it plays but an unimportant role in the distribution of plants, it is important to note that seeds adhering to the fur, as well as faeces containing the undigested seeds of wild fruits and berries, ingested as food, are left behind in foreign areas, where these often germinate and take root.

In contrast with the above, we find that the natural increase of the Black-backed jackal is checked by disease and enemies, such as the leopard, and judging by its wariness and other characteristics, its existence is certainly not an easy one.

Baobabs at N'jelele Dam

Kremetarte by N'jelele-dam

Waar die mens en sy behoeftes egter binnedring, ontstaan daar nuwe behoeftes. Om sy eie bestaan te beveilig het hy allereers die grotere roofdiere vernietig of verdryf en daarmee 'n mate van beskerming aan die rooijakkals verleen. Om die veiligheid van die oeste te verseker moes alle kleinwild, hase, patryse, fisante, ens., uitgeroei word, terwyl grotere wildsoorte wat betyds kon wegkom veiligheid elders moes vind. Hiermee het die boer homself egter 'n ondiens bewys, want hy het die rooijakkals se natuurlike voedsel verwyder en hom gedryf om onder sy skape, pluimvee en kalwers te begin vang.

Ongelukkig het die boer, in sy poging om die nuwe probleem die hoof te bied, 'n tweede dwaling begaan deur ontoereikende uitroeiingsmaatreëls te tref. In die meeste gevalle is die veldtog nie meedoënloos enduit volgehou nie en slegs die siekes, dommes, jonges en swakkelinge is vernietig, terwyl die sterk, slimmes ontkom het, met die gevolg dat 'n uithaler ras rooijakkalse feitlik kunsmatig geskep is. In die natuur teel sterk gesonde ouers gewoonlik sterk en gesonde nageslagte en die werpsels van so 'n rooijakkalsteef is gewoonlik groter as van 'n swak een. Met die gevolg dat halfhartige uitroeiingsmetodes die probleem eintlik verskerp het.

'n Derde dwaling wat die saak verder versleg het, is die onoordeelkundigheid waarmee uitroeiingsmetodes toegepas is. Gif is voor die voet uitgesit en meer nuttige aasvretende diere as rooijakkalse is vernietig. 'n Rooijakkals wat leer skaapvang het, steur hom nie aan aas nie. Die aas het dus 'n broeiplek van vlieë en brommers geword. Ook is teelgate sondermeer vol gifgas gepomp en daarmee is soveel erdvarke en maanhaarjakkalse vernietig dat miere die veld begin stroop het.

Al wil dit uit bogaande so voorkom, is die stryd op verre na nie 'n hopelose nie, maar die rooijakkals wat bederf geraak het deur te leer skaapvang sal nooit weer in die natuur 'n nuttige rol speel nie en moet dus uitgeroei word. In dié gebiede waar hy nog 'n natuurlike bestaan voer, sal hy steeds nuttig bly en sy soort sal ook daar vir die wetenskap behoue bly.

Waar die rooijakkals uitgeroei is, sal dit nodig wees om ander diere sy funksies te laat oorneem. Die ander soorte jakkalse sal die boer se beskerming moet geniet. Die silwerjakkals sal nie alleen die aas verwyder nie, maar hy en die bakoorjakkals, sowel as die maanhaar sal die kleinere knaagdiertjies in bedwang hou. Dassies sal ook maar 'n moeilike bestaan hê waar daar baie silwerjakkalse is. Die maanhaar in bondgenootskap met die erdvark sal miere op die plaas kort hou.

Ongelukkig raak party maanhaar- en silwerjakkalse ook bederf, maar die individue wat lammers vang moet vervolg en vernietig word en nie almal van hulle soort nie. Die versoeking om te leer lammers vang kan verminder word deur kunsmatig voëls soos patryse, fisante, ens., in te voer, nadat daar genoeg skuil- en broeiplekke vir laasgenoemdes voorsien is.

Soos dan aan die begin gesê, bestaan daar in die natuur slegs 'n mate van ewewig, maar die mens kan deur onoordeelkundige handeling die bietjie wat wel bestaan nog verder omverwerp. As die rooijakkals dan, weens sy aangeleerde skaapvangery, ons dwing om hom uit te skakel, is ons verplig om sy funksies aan ander diere oor te gee om ons dan op 'n natuurlike wyse te help om 'n kunsmatige, maar voller ewewig te skep.

When humans enter a new area, new problems arise. To ensure the safety of his flocks the farmer generally kills off the larger predators, and thereby a certain degree of protection is rendered to the Black-backed jackal. To make sure that his crops are not destroyed, all smaller game, e.g. hares, partridges, etc., are exterminated, and the larger game species are either killed off or driven to other parts. By doing so, the farmer does himself a great disservice because, having destroyed the natural food of the jackal, the latter is driven to feed on poultry, sheep and calves.

Unfortunately the farmer, in an attempt to tackle the new problem, made another important mistake by taking ineffective destructive measures. In most cases the methods used were not ruthless enough, with the result that only the sick, young and feeble were destroyed, while the strong and wily escaped. The result was that a super type of jackal was produced artificially. In nature, strong and healthy adults produce virile offspring, and the litter of such a bitch is usually much larger than that of a weak one. The result of this half-hearted attempt was that the problem was actually doubled instead of solved.

A third mistake, which adversely affected the outcome, was the undiscerning way in which extermination measures were applied. Poison was carelessly distributed, with the result that more useful carrion-eating animals than Black-backed jackals were destroyed. A sheep-killing jackal usually does not care to take bait and with exposed carrion lying about on the farm, flies and blue-bottles became a new problem. In other cases poison gas was simply pumped down all holes and burrows, with the result that great numbers of Aardvark and Maanhaar jackals were killed, which meant the destruction of the natural enemies of the termite.

Although it may appear so from the above, the struggle is certainly not a hopeless one. The problem can be solved. It must be realised that the sheep-killing jackal will never again play a useful part in nature and must be exterminated, but in those areas where it is still able to exist naturally, it will remain useful and its type will be preserved for the student of nature.

Where the Black-backed jackal has been exterminated, it is essential to get other animals to take over its functions. Other types of jackals as well as foxes must be protected. The Silver fox will remove all carrion and together with the Long-eared fox and the Maanhaar jackal, it will keep rodents, etc., in check, while the Maanhaar and the Aardvark will keep the termite down.

Unfortunately certain individuals amongst the Maanhaar jackals and Silver foxes have also become spoilt, but then only those catching lambs must be tracked down and destroyed. The possibility of these animals becoming lamb-killers can be prevented by artificially introducing their natural foods, such as certain game birds, etc., but only after adequate shelter has been supplied for the latter.

As stated at the beginning, there exists only a certain degree of natural balance in nature, but man can destroy even this by unintelligent actions. If then the Black-backed jackal, by its acquired sheep-killing habit forces man to exterminatory measures, man is obliged to surrender the jackal's functions to other animals, so that a fuller, though artificial, balance can be established by other means.

DIE KURPERS VAN TRANSVAAL

deur S. S. du Plessis en A. A. Groenewald

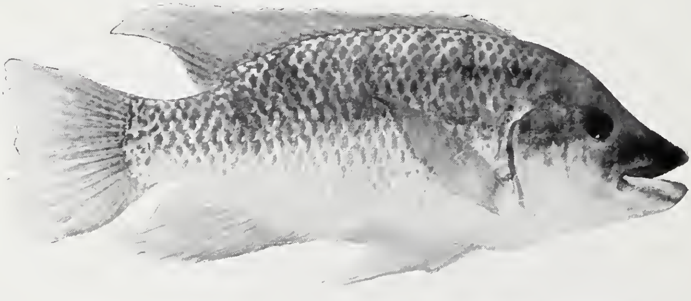
Provinsiale Visseryinstituut, Lydenburg
(Afdeling Fauna en Flora)

DIE kurper is een van die bekendste Transvaalse varswatervisse, wat nie alleen as hengelvis nie, maar ook as uitstekende tafelvis baie populêr is.

Benewens sy rol as sportvis is die kurper potensieel vir die Transvaalse laeveld van groot ekonomiese belang. Hy groei besonder vinnig en as gevolg van sy vermoë om onder ongunstige omstandighede te floreer en vinnig aan te teel, is die kurper die aangewese vissoort vir intensiewe teelt en bemarking. Net soos in die Belgiese Kongo, kan kurper-teelt in Suid-Afrika baie bydra om die toenemende proteïne-tekort aan te vul.

Daar word vyf soorte kurpers in die Transvaal aangetref. Hulle behoort aan die familie *Cichlidae,* 'n groot familie met 'n wye verspreiding in Afrika, Madagaskar, Sirië, Indië, Ceylon, Sentraal- en Suid-Amerika. Die vyf soorte toon uiteenlopende broei- en voedingsgewoontes. Sommige is oorwegend vleisvretend terwyl ander weer hoofsaaklik van plante leef. Die vorm en grootte van die neste, wat gedurende die broeityd gemaak word, verskil van soort tot soort. Die ouerlike sorg waarmee alle kurpers hulle eiers en kleintjies oppas, is verbasend. Om 'n skool onervare kurpertjies so groot soos vuurhoutjiekoppe op te pas en te beskerm teen al die vyande is ook geen maklike taak nie. Geen wonder dat party kurpers die kleingoed sommer in die mond ronddra nie! Gedurende die broeityd ontwikkel die mannetjies baie opvallende kleure.

Kurpers word dikwels met uitheemse en ander inheemse vissoorte verwar. Die besit van 'n enkel paar neusgate onderskei die kurpers van ons ander varswatervisse. Moddervisse, geelvisse, karp en swartbaars het almal twee paar neusgate. Die groot aantal stekels (d.i. stywe, onvertakte, skerppuntige vinstrale) in die rugvin is ook kenmerkend van die familie. In teenstelling met die toestand by bogenoemde soorte, bestaan meer as die helfte van die aaneenlopende rugvin van kurpers uit stekels. Die sylyn is onderbreek en daar is 'n voorste en 'n agterste gedeelte. Swartbaars en blouwang-sonvisse het 'n ononderbroke sylyn.



Tilapia mossambica.
Rooivinkurper.

Tilapia mossambica.
Redfin Kurper.

THE KURPER OF TRANSVAAL

by S. S. du Plessis and A. A. Groenewald

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THE kurper is one of the best-known sporting and table fishes of the Transvaal. Apart from its importance as a sporting fish it has a great potential value to the Transvaal lowveld. On account of its quick growth, hardy nature and great fertility it is eminently suitable for fish farming and once its value is realised, kurper farming could help materially to fight our increasing protein shortage.

The five species of kurper found in the Transvaal belong to the family *Cichlidae*, a large group of fishes with a wide distribution in Africa, Madagascar, Syria, India, Ceylon, Central and South America. The five Transvaal species have divergent breeding and feeding habits: some are predatory while others feed mainly on plants and algae. The shape and size of the nests as well as breeding behaviour also show marked differences, although the amazing parental care is common to all kurpers. It is no easy task to protect a school of minute new-born fishes against their numerous enemies, and it is not surprising to find that some kurper parents carry their young in the mouth. During the mating season, the males develop rather striking colours.

Kurper are often confused with exotic or other indigenous fishes. The possession of a single pair of nostrils distinguishes the kurper from our other freshwater fishes; mudfish, yellowfish, carp, black bass, etc., have two pairs. The lateral line of the kurper family is broken into a front and a back portion, whereas our other freshwater fishes have a continuous lateral line.

Our five species of kurper belong to three different genera. To the layman their identification is not always easy. Colour is a variable characteristic and we have to depend on more reliable characteristics like those mentioned in the table:—

Tilapia mossambica.	*Tilapia melanopleura.*	*Tilapia sparrmanii.*	*Serranochromis thumbergi.*	*Haplochromis moffattii.*
14–19 gill-rakers on lower half of first gill-arch	8–12 gill-rakers on lower half of first gill-arch	8–12 gill-rakers on lower half of first gill-arch	10–12 gill-rakers on lower half of first gill-arch	7–10 gill-rakers on lower half of first gill-arch.
2–3 series of cheek-scales	3–4 series of cheek-scales	2–3 series of cheek-scales	7–10 series of cheek-scales	3–5 series of cheek-scales.
	28–32 scales in lateral line	27–29 scales in lateral line	Anal fin with variable number of round red spots	Tailfin rounded.
	Dorsal fin with 15–16 spines and 12–13 soft branched rays	Dorsal fin with 13–15 spines and 9–11 soft branched rays		

Die vyf soorte kurpers behoort aan drie verskillende genera. Die identifikasie van die vyf soorte is egter nie altyd maklik nie. Kleur is geen onfeilbare maatstaf nie en vir noukeurige uitkenning moet ander meer konstante kenmerke soos in onderstaande tabel uiteengesit is, in aanmerking geneem word:—

Tilapia mossambica.	*Tilapia melanopleura.*	*Tilapia sparrmannii.*	*Serranochromis thumbergi.*	*Haplochromis moffattii.*
14–19 kieusifgrate op onderste helfte van eerste kiefboog	8–12 kieusifgrate op onderste helfte van eerste kiefboog	8–12 kieusifgrate op onderste helfte van eerste kiefboog	10–12 kieusifgrate op onderste helfte van eerste kiefboog	7–10 kieusifgrate op onderste helfte van eerste kiefboog.
2–3 rye wangskubbe	3–4 rye wangskubbe	2–3 rye wangskubbe	7–10 rye wangskubbe	3–5 rye wangskubbe.
	28–32 skubbe in sylyn	27–29 skubbe in sylyn	Anaalvin met 'n wisselende aantal ronde rooi kolle	Agterste rand van stertvin rond.
	15–16 onvertakte en 12–13 vertakte strale in rugvin	13–15 onvertakte en 9–11 vertakte strale in rugvin.		

Tilapia mossambica.—As mens in Transvaal van 'n kurper praat, dan bedoel jy gewoonlik maar *Tilapia mossambica* want hy is die volopste en ook een van ons populêrste hengelvisse. Op die tafel is hy net so gewild want hy is 'n lekker vis met min grate. Oor hom word hengelaars nooit uitgepraat nie en hulle noem hom ook by verskillende name soos rooivinkurper, bloukurper, witkurper, grootbekkurper. Rooivinkurper is nog die beste naam want die rug- en stertvinne het 'n rooi randjie. Somtyds tref mens dit egter by ander kurpers ook aan. Die mannetjie en wyfie verskil so baie van mekaar dat meeste hengelaars hulle beskou as twee aparte soorte. Die mannetjie is die ou groot bloue met die lang bek en die dik kake. Sy profiel is ook effens ingeduik van voor en hy is in die broeityd donker van kleur. Die wyfie is weer vaal op die rug en wit op die pens met 'n klein netjies-gevormde kop en bek. In troebel water is sy somtyds baie ligvaal van kleur. Nou kan mens verstaan hoekom die hengelaars dieselfde vis bloukurper en witkurper kan noem. In die broeityd wanneer die wyfie eiers of kleintjies in haar bek dra, is die keel effens uitgedruk na onder en dit onderskei haar baie duidelik van die mannetjie.

Die rooivinkurper kom slegs voor in riviere wat in die Indiese Oseaan vloei. Hy word aangetref tot sover suid as die Boesmansrivier by Alexandria. Hy kan nie die koue van die hoëveld weerstaan nie en leef net in die warm waters van die laeveld. Hartebeestpoortdam is een van ons beste kurperwaters en tog sterf daar sommige jare duisende kurpers van koue. Die rede is dat die dam op die rand van die hoëveld lê en deur koue hoëveldse riviere gevoed word. Die dodelike temperatuur vir die rooivin is rondom 50° F. (10° C.).

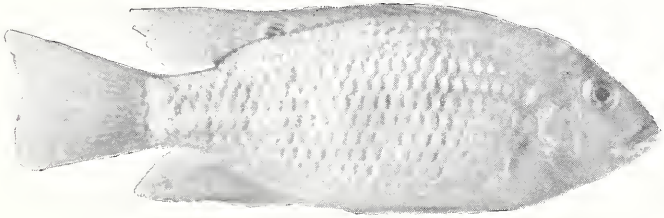
Hierdie kurper vreet hoofsaaklik alge wat op die bodem-modder en op klippe, waterplante en boomstompe in die water groei. Hulle filtreer ook klein waterdiertjies en drywende alge uit die water uit.

Tilapia mossambica.—When speaking of kurper in the Transvaal, we are usually referring to *Tilapia mossambica* because it is widely distributed and very popular amongst sportsmen. On the table it is also a great favourite because it has a good flavour and very few bones. Anglers never stop talking about this fish and they call it by various names like redfin kurper, blue kurper, white kurper, largemouth kurper. Redfin kurper is the best name because the edges of the dorsal- and tailfins are red. However, this may sometimes be found in other kurpers as well. The male and female differ quite markedly and many anglers regard them as two different species. The dark bluish one with the long snout and thick jaws is the male. His profile is slightly concave and during the mating season he becomes very dark in colour. The female is light-coloured, grey on the back and white on the belly with a small neatly formed head and mouth. In muddy water she has an almost silvery white appearance. This explains why the same fish is known as blue kurper and white kurper. During the breeding season when the female carries eggs or young in her mouth, her throat bulges slightly and this also distinguishes her from the male.

The redfin kurper occurs in rivers flowing into the Indian Ocean as far south as the Bushmans River near Alexandria in the Eastern Province. It cannot withstand the cold of a highveld winter and thrives only in the lowveld. Hartebeestpoort Dam is one of our best kurper waters and yet sometimes thousands of kurper die here from cold. The reason is that this water lies on the edge of the highveld and is fed by cold highveld rivers. The lethal temperature for redfin kurper is approximately 50° F. (10° C.).

The food of this fish consists mainly of algae growing on the bottom mud, submerged stones and tree trunks and the stems of waterplants. They also filter small Crustaceans and floating algae from the water.

It breeds as soon as the water temperature rises to 65° F. in the early summer. A shallow depression is dug in the bottom in shallow water until a firm substratum is reached. After the eggs have been laid and fertilised here, the female picks them up in her mouth and carries them around. The newly born fry are quite helpless and thrive on the yolk sac, and after a few days they come out of the mouth of the mother in search of food. Upon a signal from their mother, they quickly swim back into her mouth when danger threatens. This is the best protection that any small fish could wish for, and while the mother guards them very few are lost.



Tilapia melanopleura.
Redbreasted Kurper.

Tilapia melanopleura.
Rooiborskurper.

Hulle broei in die voorsomer sodra die water begin warm word. In vlak water langs die kant word 'n vlak holte in die bodem gemaak totdat 'n vaste onderlaag bereik word. Hierin word die eiers gelê en bevrug. Daarna tel die wyfie die eiers in haar mond op en dra dit saam met haar. As die kleintjies uitbroei is hulle eers vir 'n tyd heeltemal hulpeloos maar binne 'n paar dae verlaat hulle die moeder se bek op soek na kos. As gevaar dreig, vlug hulle op 'n teken van die wyfie gou terug in haar mond waar geen vyand hulle kan bykom nie. Dit is die doeltreffendste beskerming wat 'n klein vissie kan begeer en solank die wyfie hulle oppas, gaan daar ook baie min van hulle verlore.

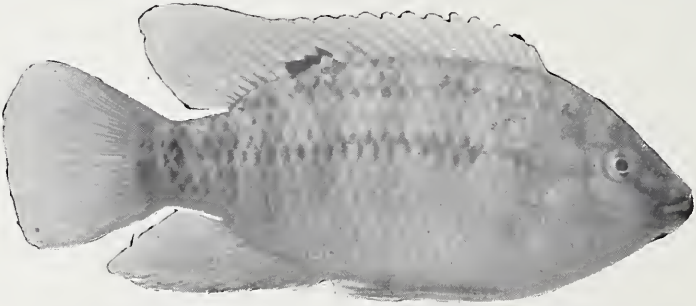
Die rooivinkurper is een van ons populêrste hengelvisse en die roem van hengelplekke soos Hartebeestpoort, Loskop, Rus-der-Winter en Njelele damme is toe te skryf aan die groot rooivinkurpers wat daar uitgetrek word. Hierdie kurper hou van staande water en byt die beste op 'n warm dag. Die beste aas is erdwurms alhoewel hy ook aan 'n kriek of sprinkaan sal byt. Die Suid-Afrikaanse rekord rooivinkurper is in Hartebeestpoortdam gevang en het 5 lb. 9 onse geweeg.

Op die tafel hoef die rooivinkurper vir min visse agteruit te staan want hy het lekker vleis en min grate. Daarom hou laeveldse boere hom graag in hulle damme aan. Hy aard ook goed in sementdamme.

Tilapia melanopleura staan bekend as die rooiborskurper of stompneuskurper. Hierdie pragtige vis met sy bloedrooi bors is maar skaars in Transvaal. Die enigste plek waar hy gereeld gevang word is Loskopdam en selfs hier is hy maar onlangs ontdek, waarskynlik omdat die hengelaars hom vroeër nie herken het nie. Omdat die rooi kleur op die bors, veral in wyfies, somtyds nie baie duidelik is nie, kan mens hom ook nie altyd maklik onderskei van die rooivinkurper nie. By die volwasse rooibors is die onderste helfte van die stertvin anders gekleurd as die boonste helfte. As mens sy kiefdeksel oplig, kan jy dadelik sien dat hy minder kieusiftande op die voorste kiefboog het as die rooivin. Sy voorkop is ook meer regaf en daarom noem party hengelaars hom 'n stompneuskurper.

Die rooibors word aangetref in die Limpopo-sisteem en is ook bekend in Swaziland en Zululand se riviere. Hy is baie sku vir koue en leef net in die egte laeveld waar die water nooit koud word nie.

Die rooiborskurper het 'n groot voorliefde vir waterplante en daarom is hy 'n baie nuttige vis in plaasdamme wat deur watergrasse oorgroei is. Hy vreet selfs papkuil en vleigras, en het 'n besondere voorliefde vir



Tilapia sparrmannii.
Vleikurper.

Tilapia sparrmannii.
Vlei Kurper.

It is one of our most popular sporting fishes and the fame of fishing waters like Hartebeestpoort, Loskop, Rus-der-Winter and Njelele Dams is due to the many fine redfin kurper caught there. They like stagnant water and bite best on a hot day. Earthworms are the standard bait although they will also take grasshoppers or crickets. The South African record was caught in Hartebeestpoort Dam in 1952 and weighed 5 lb. 9 ozs.

This kurper is an excellent table fish with very few bones. Farmers of the lowveld like to stock their farm dams with this fish. It also does well in cement reservoirs where it is useful in keeping down the growth of filamentous green algae.

Tilapia melanopleura is popularly known as the redbreasted kurper or stumpnose kurper. This beautiful fish with its bright red breast and throat is rare in Transvaal. Loskop is the only water where it is regularly caught, and even here the anglers only recently discovered it, probably because earlier they did not recognise it as *Tilapia melanopleura.* Because the red colour is not always present, it is sometimes hard to distinguish from *Tilapia mossambica* which occurs in the same water. In the adult redbreasted kurper the lower half of the tailfin is clearly demarcated from the upper half because of a difference in the colour of the two halves. If the gill-cover is lifted, one can identify it by the presence of from 8 to 12 gill-rakers on the first gill-arch (see table). Because of the rather straight profile some anglers call it stumpnose kurper.

This species is found in the Limpopo system and also in the rivers of Swaziland and Zululand. Northwards it is found as far afield as the Belgian Congo. It avoids cold water and lives only in the true lowveld.

The main food of this kurper consists of aquatic plants, and it is a very useful fish in farm dams which are overgrown with weeds. It will even feed on young bullrushes and vlei grasses. It is particularly fond of Kikuyu grass which grows into the water from the dam wall. Because of its preference for plants, it plays an important rôle in Tilapia farming of the Belgian Congo. It is used to keep the dams clean, thus converting weeds into fish. It can also be fed on soft grass, vegetable leaves, sweet potato leaves and similar green foods.

It breeds right through the summer. The adhesive eggs are laid on a cleaned spot against the bank. The male and female assist each other in guarding them because fish eggs are a great delicacy which will soon be devoured by other fish and aquatic animals. When the small fish, now known as alevins, hatch out they are extremely small and helpless and the parents keep them in holes which have previously been dug in the banks. There are a number of these holes and the young are regularly shifted from one to the other, apparently for hygienic reasons. After a few days they start to swim about in a shoal in search of food and now the parents have a busy time protecting them against other fish. Within two to three weeks the young are left to fend for themselves because parents must prepare for the next brood.

Earthworms are good bait for this kurper. In 1952 it was introduced into the Njelele Dam at Louis Trichardt where it is progressing well.

Tilapia sparrmannii seldom grows longer than six inches and is popularly known as green kurper, Sparrmann's kurper and vlei kurper. It is found all over the Transvaal, even in the Vaal River, and it is the only known Tilapia species which can withstand the cold of a highveld winter. It is recorded as far north as the Belgian Congo. It can best be

Kikuyugras wat in die water in rank. Om hierdie rede speel die rooiborskurper 'n belangrike rol in visboerdery in die Belgiese Kongo; hy word gebruik om die damme skoon te hou. Mens kan hom ook op groen gras, slaai, patatblare en dergelike groenigheid voer.

Die rooibors broei dwarsdeur die somer. Sy eiers word gelê op 'n skoongemaakte plekkie teen die wal en daar bly hulle vaskleef. Die mannetjie en wyfie moet mekaar help om hulle op te pas want viseiers is 'n groot lekkerny wat gou deur ander vis en waterdiere opgevreet sal word. Wanneer die kleintjies uitkom, is hulle amper onsigbaar, klein en hulpeloos, en word in gate wat vooraf in die wal gemaak is, gebêre. Daar is 'n hele paar gate en die kleintjies word gereëld van een gat na 'n ander oorgeplaas. Na 'n paar dae begin hulle in 'n skool rondswem op soek na kos en dan het die ouers 'n moeilike taak om hulle bymekaar te hou en teen ander visse te beskerm. Die kleintjies word binne twee tot drie weke aan hulleself oorgelaat want die ouers moet alweer klaarmaak vir die volgende broeisel.

In Loskop byt die rooiborskurper ook maar aan erdwurms. Hulle is ook onlangs in die Njeleledam ingevoer waar hulle nou goed vorder.

Tilapia sparrmannii word selde langer as ses duim en staan bekend as groenkurper, Sparrmann se kurper of vleikurper. Hy word aangetref oor die hele Transvaal selfs in die Vaalrivier en is die enigste Tilapiasoort wat die koue van 'n hoëveldse winter kan weerstaan. Verder noord word hy aangetref tot in Belgiese Kongo. Dit kan van ander kurpers onderskei word deur die heldergroen skynsel op die skubbe. Verder moet mens kyk na die kieusiftande en die strale van die rugvin soos in die tabel aangegee.

Sy kos bestaan uit groen alge, klein waterdiertjies en sagte groen waterplante. Vir hengelaars is hy nutteloos want hy is te klein maar hy is belangrike kos vir ander visse.

Die vrugbaarheid van die groenkurper is ongelooflik. Hulle broei feitlik dwarsdeur die somer en is dus 'n goeie vis om saam met roofvis soos swartbaars op die hoëveld in plaasdamme aan te hou.

Die broeigewoontes stem baie ooreen met dié van die rooibors. Die eiers is langwerpig en olyfgroen van kleur en word op 'n klip, die stingel van 'n riet of op 'n harde plekkie op die bodem gelê. Die mannetjie en wyfie pas die eiers op. Een van hulle lê oor die nes en roer met sy vinne sodat daar altyd varswater oor die eiers stroom terwyl die ander een daar naby waghou. Ongeveer elke minuut ruil hulle posisies om. Die kleintjies word ook in gaatjies in die bodem gebêre totdat hulle kan swem. Elke kleintjie het vier slymkliere op sy kop. Hierdie kliere skei 'n deurskynende slym af wat die vissie binne-in die gaatjie vasanker. Om 'n sirkulasie van water in die gaatjie te verseker waai elke klein vissie voortdurend sy stertjie. Elke dag word die kleintjies een vir een in die bek van die ouer opgeneem en oorgeplaas in 'n skoon gaatjie. Daar is gewoonlik drie gaatjies. Wanneer hulle begin swem, beweeg hulle in 'n kompakte skool saam met die ouers. As gevaar dreig, sak hulle op 'n teken van die ouers af na die bodem. In die teenwoordigheid van roofvisse het die ouers 'n baie moeilike taak want ander vis probeer dikwels om die skool kleintjies uitmekaar te jaag om hulle makliker te vang. Sodra die een skool kleintjies selfstandig is, maak die ouers aanstaltes om weer te broei.

Serranochromis thumbergi is populêr bekend as die kanariekurper. Hy word aangetref in die Limpopo-sisteem, meesal in die westelike helfte van Transvaal. Alhoewel hy net in die laeveld aangetref word, kan hy ook op die hoëveld lewe. Die naam kanariekurper het hy te danke aan

distinguished superficially by the green colour on the scales. It is safer, however, to compare the number of gill rakers and fin rays of the dorsal fin with those given in the table.

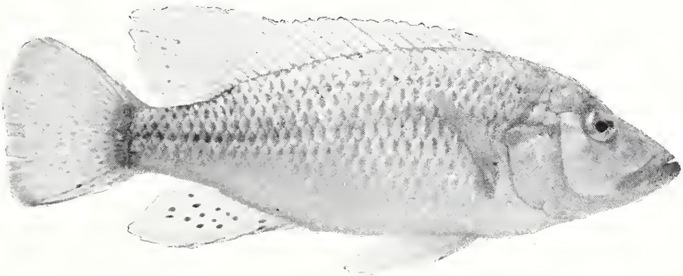
Its food consists of green algae, small aquatic animals and soft water-plants. It is relatively useless to anglers but forms important food for other fishes. This extremely prolific fish breeds almost right through the summer and is a good forage fish for black bass in farm dams on the highveld where the bigger Tilapias cannot live.

The breeding habits are very similar to those of *Tilapia melanopleura.* The oblong olive-green eggs are laid on a stone, the stem of a reed or a clean spot on the hard bottom. The male and female both guard the eggs. One of them lies over the eggs fanning them with its breast fins, while its mate is on guard some distance away. Roughly every minute they change positions. The young are kept in small holes in the bottom until they start swimming. Every alevin has four mucus glands on the head. These secrete a sticky, colourless mucus by means of which the small fish is anchored to the bottom or sides of the hole. In order to ensure circulation of water in the hole, every alevin's tail is constantly vibrating. Every day the parent takes them in its mouth one by one and transfers them to a new hole: there are usually three holes. When the alevins start to swim they are called fry; they move in a compact shoal guarded by both parents. Predatory fish sometimes dart right into such a shoal in order to scatter them so that they can be caught more easily. When one brood of young becomes independent, the parents rest for only a short while before making another nest.

Serranochromis thumbergi is popularly known as the canary kurper. It is found in the Limpopo system, mostly in the dry western part of the Transvaal and northwards to the Congo. Although this is a tropical species, it can also withstand the severe cold of the highveld. It owes its name to the bright yellow of the belly. The anal fin has a number of bright red dots which are larger and more plentiful in males than in females.

The canary kurper is a predator, thriving on small fish, insects and snails. Because of its snail-eating habits, tests are now being made to determine whether this fish could help in the fight against bilharzia-carrying snails.

It is not an important sporting fish in the Transvaal on account of its small size, but in the Zambezi River large species of Serranochromis are superior sporting fishes.



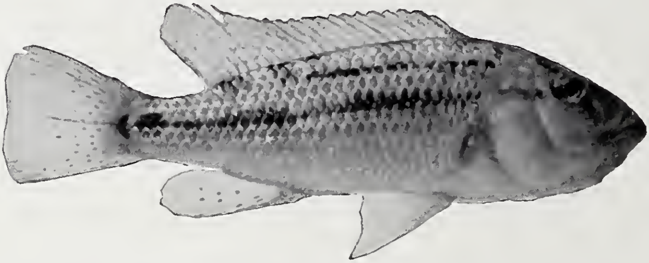
Serranochromis thumbergi.
Canary Kurper Male.

Serranochromis thumbergi.
Kanariekurper mannetjie.

die heldergeel kleur onder sy pens. Die bek is baie groter as dié van die Tilapia-groep. Die anaalvin het 'n aantal helderrooi kolle. Hierdie kolle is groter en meer talryk in mannetjies as in wyfies.

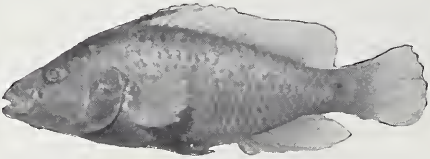
Die kanariekurper is 'n vleisvreter wat lewe van insekte en klein vissies. Omdat hy ook slakke vreet, kan hy moontlik gebruik word in die bestryding van bilharzia in plaasdamme. As hengelvis is hy nie belangrik nie want hy word selde swaarder as een pond. Hy byt aan erdwurms, krieke en sprinkane.

Haplochromis moffattii, die dwergkurper, lyk oppervlakkig baie soos die kanariekurper behalwe dat die kop swaarder gebou is. Hy het ook 'n gelerige kleur met dieselfde rooi kolle op die anaalvin. Verder moet mens let op die verskille wat in die tabel aangegee word. Die dwergkurper word nie groter as vier duim nie en is 'n roofvis wat op insekte en die eiers en kleintjies van ander visse lewe. Hy is nutteloos vir enigiets behalwe vir naturelle en word algemeen deur hengelaars as 'n oorlas beskou. In plaasdamme is hy ook ongewens. Hy word aangetref dwarsoor Transvaal tot in die Vaalrivier. Hy is ook 'n bekbroeier.



Kanariekurper wyfie met eiers in haar bek. Let op hoe die keel uitdruk.

Canary Kurper Female with eggs in her mouth. Note the bulging throat.



Haplochromis moffattii.
Dwergkurper.

Haplochromis moffattii.
Dwarf Kurper.

The canary kurper is a mouth breeder, the female carrying the eggs.

Haplochromis moffattii, the dwarf kurper or mouth breeder, looks superficially very similar to the canary kurper except that the head is bigger. The colour is yellowish green with red spots on the anal fin. During the mating season the colour of males is intensified, the paired fins becoming tinged with black. For identification, reference should be made to the table.

The dwarf kurper is carnivorous, thriving on insects and the eggs and young of other fish. It is useless and generally regarded by anglers as a nuisance. In farm dams it is also undesirable. It is found all over the Transvaal in both lowveld and highveld, also occurring in the Vaal River system.

Wild Gardenia.
Wilde Katjiepiering.

(Photo/Foto: S. S. du Plessis)

DIE COYOTE EN DIE ROOIJAKKALS

'n Vergelyking van ooreenstemmende eienskappe

deur N. J. v. d. Merwe, D.Sc.

(Afdeling Fauna en Flora)

DAAR is baie opvallende ooreenstemmende eienskappe en gewoontes tussen die rooijakkals en sy Noord-Amerikaanse verwant, die coyote, maar slegs enkeles sal hier bespreek word.

Volgens Dobie(7) en Goldman(10) is die coyote baie lui om self 'n broeigat voor te berei en sal so 'n teef baie eerder gebruik maak van een wat deur 'n vos of ratel gegrawe is, en Goldman(10) beskryf dat vosse dikwels uit hulle teelgate vir hierdie doel verdryf word. Alhoewel daar geen rekord bestaan dat 'n rooijakkals ander diere uit gate verdryf nie, is dit tog algemeen bekend dat die rooijakkals uiters traag is om self 'n gat te grawe en verkies om die onbewoonde gate van erdvarke oor te neem.

In teenstelling met die coyote, waar volgens Cahalane(2) meer as een teef in een gat aangetref word, sal die rooijakkalsteef nog ystervarke in dieselfde gat duld, maar nooit ander jakkalstewe nie.

Cahalane(2) noem dat die coyote-moeder die kleintjies speen deur hulle gedeeltelik verteerde kos te voer, wat deur haar, of soms deur die reun opgebring word. Dieselfde gebeur met die rooijakkalskleintjies, met dié verskil dat die gevalle waar die reun met die proses help, die hoë uitsondering is.

In albei gevalle is die diere baie gebiedsbewus. Cahalane(2) noem dat in die geval van die coyote die jonges later verplig is om hulle ouers te verlaat en vir hulself jaggebiede te vind. Net so word die jong rooijakkalse òf vedryf, òf deur die teef weggelei na ander gebiede, terwyl die ouers na hulle eie tuiste terugkeer.

Beide die coyote en die rooijakkals het oorspronklik 'n waardevolle rol gespeel in die daarstelling en behoud van watter mate van natuurlike ewewig daar ook in hulle omgewings bestaan het, maar met die koms van die beskawing het hulle nut oënskynlik verdwyn.

Volgens Henderson(14) het uitstaande natuurkundiges tot die gevolgtrekking gekom dat die vernielsug van die coyote enige nut oorweeg wat hy wel mag hê, soos bv. die kontrole van knaagdiere. Couch(4) meen dat die coyote vandag maar 'n geringe rol in die behoud van die ewewig in die natuur speel.

Vergelykend kan genoem word dat die rooijakkals in die verlede 'n belangrike aasvreter was, asook 'n nuttige skakel in die beheer van knaagdiere sowel as ander skadelike diertjies, maar onder die invloed van die beskawing het hy 'n dier geword waaroor FitzSimons(8) skryf „. . . een waaroor die doodvonnis gevel moet word ". Daar moet egter nog vandag 'n belangrike verskil getref word tussen die skaapvangende rooijakkals en dié wat in wildtuine, reserwes en op wildplase aangetref word. In sy normale omgewing is die rooijakkals nog 'n

THE COYOTE AND THE BLACK-BACKED JACKAL

A comparison of certain similar characteristics

by N. J. v. d. Merwe, D.Sc.

(Fauna and Flora Section)

THERE are many marked similarities between the habits of the Black-backed jackal and its North American relative, the Coyote, but only some of these will be discussed.

According to Dobie(7) and Goldman(10) the Coyote is too lazy to prepare a breeding hole and would much rather den and pup in one dug by another animal, such as a fox or a badger. For instance Goldman(10) records that foxes are often chased from their dens for this purpose. Although there is no record of a Black-backed jackal driving another animal from its den, it is common knowledge that the digging of a hole by this jackal is the exception to the rule and that the uninhabited earths of the Aardvark are generally favoured for denning.

In contrast with the Coyote where, according to Cahalane(2), females den together, the Black-backed bitch will share an earth with porcupines, but never with other jackals or foxes. Cahalane(2) also mentions that the Coyote mother weans her off-spring by feeding to them partly digested food, regurgitated from her stomach, or sometimes from the father's. The same thing happens to the Black-backed puppies, with the exception that the occasions where the male helps in this respect are extremely rare.

In both the Coyote and the Black-backed jackal the sense of priority in the possession of a hunting preserve established years before, is very strong. Cahalane(2) mentions that the young coyotes are eventually obliged to leave and find unstaked territory for themselves. In the same way, young jackals are either driven off or led away by their parents to neighbouring areas to find new hunting grounds, while the adults return to their own.

Both the Coyote and the Black-backed jackal originally played an important role in the establishment and maintenance of whatever degree of natural balance there existed in their areas, but with the coming of civilization their usefulness has been lost.

According to Henderson(14), outstanding naturalists have come to the conclusion that the destructive habits of the Coyote today far outweigh any good they do, e.g. the control of rodents. Couch(4) expresses the opinion that Coyotes today play but a small part in maintaining the balance in nature.

In comparison it may be noted that the Black-backed jackal was in the past an important carrion remover as well as a valuable factor in the control of rodents and other harmful animals, but under the influence of civilization it has become an animal about which FitzSimons(8) wrote: ". . . one on which the sentence of death must be pronounced . . .". But even today an important difference must be recognised

baie nuttige dier. Ongelukkig het hy egter net soos die coyote, soos deur Dixon(6) en Goldman(9) (10) genoem, die vermoë om verbasend goed by omstandighede soos deur die mens geskep, aan te pas, en as hy eers een keer leer skaapvang het, is hy verder van geen nut nie.

Die intog van die mens in nuwe gebiede in suidelike Afrika het die vernietiging van die grotere roofdiere meegebring. Intrekkers was terwille van hulle vee verplig om luiperds en jagluiperds, sowel as grotere roofvoëls, te verdryf of vernietig, maar ongelukkig het hulle daardeur ook belangrike natuurlike vyande van die rooijakkals uit die weg geruim. Sodoende is groot gebiede vir die rooijakkals veilig gemaak en hulle was slim genoeg om dit te besef en in te trek.

In Noord-Amerika het dieselfde ding met die coyote gebeur. Goldman(9) (10) noem dat die coyote oor groot gebiede versprei het as gevolg van die intrek van mense. Hy sowel as Hall(12) meen dat die coyote sy skaapvangery aangeleer het as gevolg van die aanraking met die boer en sy vee.

Wat vir Suid-Afrika geld, is heelwaarskynlik ook waar vir Noord-Amerika, nl. dat met die verskyning van die mens baie diere verdryf of vernietig word en so ook natuurlike vyande van die coyote, soos bv. die cougar, goue arend en die grotere herte. Volgens Cahalane(2) word baie coyotes deur herte doodgetrap. Grinnell(11) noem dat arende heelwat coyotes vang.

Goldman(10) konstateer dat in gebiede waar die coyote byna uitgeroei is, daar altyd 'n vinnige aanwas in die getalle van die herte, wilde kalkoene en ander wildsoorte volg. In Suid-Afrika ondervind boere wat die rooijakkals op hulle plase uitgeroei het 'n soortgelyke vermeerdering onder die kleiner boksoorte, fisante en patryse, maar ongelukkig ook onder skadelike diertjies soos dassies, springhase, ens. In hulle ywer om van die rooijakkals ontslae te raak, het baie boere ongelukkig ook die nuttige jakkalse vernietig, met die gevolg dat die dassies sonder

(Foto/Photo: H. Lang.)

Rooijakkals (*Thos mesomelas*). Black-backed Jackal (*Thos mesomelas*).

between the sheep-killing jackals and those found in parks, reserves and on game farms. In its normal natural surroundings the jackal is still a very useful animal. However, like the Coyote, as recorded by Dixon(6) and Goldman(9) (10) it has shown a remarkable adaptability to survive the contact with man, and if once forced by circumstances to kill sheep, it loses all usefulness.

The migration by man into new areas in southern Africa, meant the destruction of the larger predators. Pioneers were forced to safeguard their stock, but at the same time leopards, cheetahs and some of the larger birds of prey, important natural enemies of the jackal, were either exterminated or driven to other strongholds. In this way man made large areas safe for the jackal, which soon realised the fact and moved in, more especially because with the farmer came his flocks.

In North America the same thing happened with regard to the Coyote. Goldman(9) (10) records that the Coyote greatly extended its range as a result of new areas being occupied by humans. According to this writer as well as Hall,(12) the Coyote, in contact with farmers' flocks, develop sheep-killing habits.

What is true for South Africa may be true for North America, viz. that with the moving in of man, the larger animals disappeared, including important natural enemies of the Coyote, such as the Cougar and Golden eagle as well as the larger types of deer, which according to Cahalane(2) often trample coyotes to death. Grinnell(11) records that eagles prey on coyotes.

Goldman(10) states that wherever coyotes have been greatly reduced in numbers there followed a marked increase in deer, wild turkeys, sage hens and other game species. In South Africa farmers who have exterminated jackals and foxes on their farms, experienced a similar increase in the numbers of the lesser antelopes, pheasants and partridges, but at the same time harmful animals, such as Rock rabbits, Springhares and others also seem to thrive. In their eagerness to get rid of the Black-backed jackal, most South African farmers blundered and killed many of the harmless jackals and foxes, with the result that the Rock rabbits, etc., were left without any natural check. It stands to reason that the harmless jackals and foxes will also kill many game animals, but much less so than the Black-backed jackal.

The hunting and feeding habits of the Coyote and the Black-backed jackal are much the same. Both stalk and pounce upon smaller animals such as rodents, but it would appear that the Coyote is more advanced in some ways, e.g. Dobie(7) describes how the scheming Coyote builds V-shaped walls in front of the openings of Prairie dog dens so that the rain water floods the inmates out, ensuring easier capture. No such thing has been recorded about the jackal. Both, however, are known to dig for small rodents.

Dobie(7) and other writers record that coyotes hunt in pairs and according to Cahalane(3) they sometimes hunt in partnership with badgers. Although the Black-backed jackal male and female regularly hunt together, they never form partnerships with other animals. It often happens, however, that they follow the larger predators such as lions, to feed on the remains of the kill.

hulle natuurlike vyande oorgebly het. Dit spreek vanself dat die sgn. nuttige jakkalse tog skade sal doen, soos bv. hoenders vang, maar dit sal baie minder wees as wat die rooijakkals sal berokken.

Die jag- en voedingsgewoontes van die coyote en die rooijakkals stem baie ooreen. Beide bekruip en bespring kleiner diertjies soos knaagdiere, maar dit wil voorkom of die coyote tog 'n bietjie verder ontwikkeld is, want Dobie(7) vertel hoe die coyote 'n V-vormige walletjie voor die opening van die „ Prairie dog " se skuilgat gooi in die hoop dat stormwater van die naderende reënbui die bewoners sal uitdryf. Daar bestaan geen rekords van dergelyke planmakery by die rooijakkals nie. Dit is bekend dat albei hierdie diere klein knaagdiertjies uitgrawe.

Volgens Dobie(7) en ander skrywers jag coyotes gewoonlik in pare, maar Cahalane(2) beskryf ook gevalle waar 'n coyote in geselskap van ratels aangetref is. Alhoewel die rooijakkalsreun en sy teef gereeld saam jag, vind ons hulle nooit in vennootskap met ander diere nie. Dit gebeur egter dikwels dat hulle grotere roofdiere soos leeus volg en aan die oorblyfsels van laasgenoemde se vangs vreet.

Net soos die coyote, soos deur Dobie(7) beskryf, vang die rooijakkals groter diere deur hulle van agter in te hardloop en aan die nek beet te kry. Dobie(7) en Skinner(17) meen dat waar die coyotes in troppe jag, hulle 'n groot bedreiging vir die bestaan van die „ Pronghorn "-herte is. In teenstelling hiermee, vind ons dat gevalle waar rooijakkalse in troppe jag, uiters selde voorkom, gewoonlik net in die dorre gebiede van Suid-Afrika, soos in die Kalahari- en Namib-woestyne. In sulke troppe is hulle gedugte jagters.

Henderson(11) beskryf 'n vorm van moordlus by die coyote, waar baie meer diere gedood word as waaraan gevreet word. Hierdie gewoonte is ook goed bekend onder die rooijakkals, veral net voor en gedurende die paartyd. Tot 70 lammers is al deur 'n enkele paar jakkalse in een nag doodgebyt, maar eienaardig genoeg, bestaan daar geen rekord waar 'n paar jakkalse so moordlustig onder wilde diere gevang het nie. Jong rooijakkalse wat pas die kuns om te vang aangeleer het, vang dikwels ook baie meer lammers as wat hulle kan opvreet.

Jaeger(15) en Murie(16) noem albei dat die coyote tot 'n mate op plantkos teer, maar Sperry(18) (19) het deur laboratorium-analises bewys dat die hoeveelheid baie kleiner is as wat miskien vermoed was. Jaeger(15) het bewys dat sade wat uit coyote-ontlasting gehaal is, nog maklik ontkiem. Vergelykend kan genoem word dat die rooijakkals graag veldvrugte en bessies vreet, asook gewone vrugte, veral druiwe.

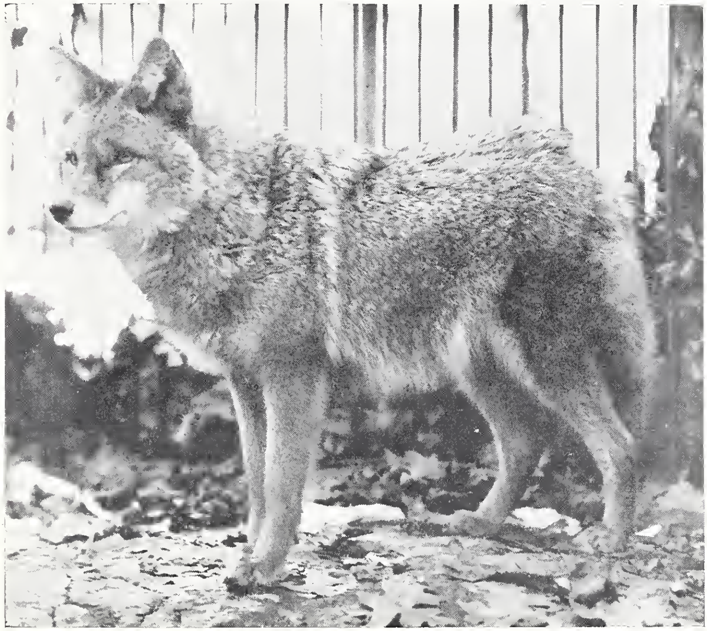
Volgens Bryant(1) is die coyote nie bang vir water nie en hy beskryf 'n geval waar een van een rivier-eiland na die ander agter watervoëls aangeswem het. Volgens Dobie(7) en ander outeurs vang hulle ook graag vis. In teenstelling daarmee bestaan daar geen rekord waar 'n rooijakkals vis gevang het nie, maar hy is definitief nie bang vir water nie. Verskeie gevalle is bekend waar die rooijakkals van sy agtervolgers probeer ontkom het, deur in water weg te kruip en slegs sy snoetpunt bo die oppervlakte gehou het om nog asem te kan haal. Hy gaan maklik deur water wanneer hy op jag uit is.

Heller(13) beweer dat daar by die jakkals en die coyote sulke konstante, ooreenstemmende tand-eienskappe bestaan dat dit heeltemaal geregverdig is om hulle in een genus, nl. Thos, te plaas, maar wat hier van belang is, is die opvallende ooreenstemming tussen die eienskappe en gewoontes van twee diere soos dit op twee verskillende kontinente ontwikkel het.

Like the Coyote, according to Dobie(7), the Black-backed jackal will run down bigger prey and kill by pouncing on the neck. Dobie(7) and Skinner(17) record that coyotes hunting in packs present great danger to the Pronghorn and other deer. In contrast we find that Black-backed jackals are only found in packs in the very dry parts of South Africa, such as the Kalahari and Namib deserts. In such packs they are formidable killers.

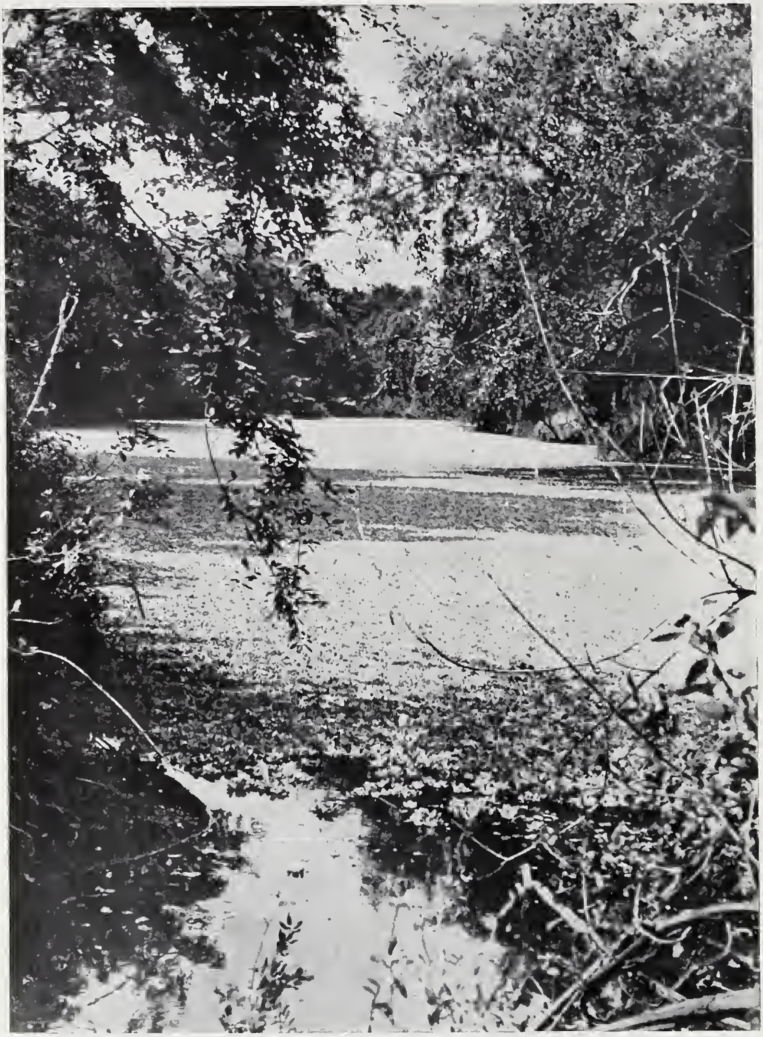
Henderson(11) describes a certain lust for killing in the Coyote. On such occasions more animals are killed than is necessary for food. This habit is also common to the Black-backed jackal, especially just before and during mating seasons. Up to seventy lambs have been killed by a pair of jackals in one night, but it is strange that there are no records of such killings by jackals among wild animals. Young jackals after being initiated in the art of killing, often show the tendency to kill more lambs than is required for food.

Jaeger(15) and Murie(16) both record that the Coyote feeds to a certain extent on plant material. Sperry,(18) (19) however, proved by laboratory analyses that the percentage is far less than is generally expected. Jaeger(15) established that all plant seeds collected from coyote-faeces readily germinate. In comparison the Black-backed jackal is also



(Photo/Foto: New York Zoological Society

Coyote (*Canis latrans*).



Die Nyl-waterplant (*Pistia stratiotes*) op die Spokanjol-watergat van die Limpopo—Pafuri-wildreserwe.

The Nile water plant (*Pistia stratiotes*) on the Spokanjol pool of the Limpopo—Pafuri Game Reserve.

(Foto/Photo: T. J. Steyn)

considered to be a seed distributor in a small way. They seem to feed freely on ripe wild berries and fruits and they have been known to eat fruit, especially grapes.

Bryant(1) records that the Coyote is not afraid of water and describes an occasion where a Coyote swam from one river island to another, hunting water fowl. According to Dobie(7) and other writers it is known to fish like a coon. In contrast the Black-backed jackal has no recorded fishing habits, but it is certainly not afraid of water. There are several records of jackals trying to hide from hunters by lying flat in the water, with only the nose protruding above the surface. It will often go through water after prey.

According to Heller(13) jackals and coyotes show such constant similar dental characteristics that it is justifiable to group them under the same generic name, viz. Thos, but the point of interest here is the marked parallelism in the development of the characteristics of these two animals on two different continents.

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„WHITE SPOT"-SIEKTE BY FORELLE

deur P. J. le Roux

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(Afdeling Fauna en Flora)

DIE parasiet *Ichthyophthirius multifiliis,* beter bekend as „white spot", is oor die hele wêreld 'n bedreiging vir varswatervisse. Dit is 'n eensellige parasiet wat alle soorte vis aanval. Dit kom op die lyf, kieue, vinne en selfs binne in die mondholte voor.

By visteelstasies met hulle groot getalle vis is die siekte veral 'n groot gevaar as dit nie dadelik en op die regte manier bestry word nie. Om dit te kan doen, is kennis van die lewenssiklus van die parasiet noodsaaklik.

Nadat die parasiet op die vis kom, dring dit onder die buitenste lae van die vel in en is dus nie vatbaar vir dipmiddels nie. Na 'n paar dae is dit volwasse en dan verlaat dit die gasheer en val na die bodem waar dit encysteer en verdeel in 'n menigte klein parasiete. Nou breek die cyst oop en die klein parasiete swem rond met behulp van hul cilia op soek na 'n nuwe gasheer, wat hulle moet bereik binne 'n paar dae, anders gaan hulle dood.

In 1952 het die siekte by die Provinsiale Visseryinstituut te Lydenburg uitgebreek en die eerste tekens is op 4 Augustus opgemerk. Toe is 'n paar forelvingerlinge gesien met die kenmerkende wit knoppies omtrent so groot soos speldkoppe. Die wit knoppies is moeilik sigbaar in die grootmaaktenks en om die persentasie besmetting vas te stel, word die vis in 'n swart bakkie gehou waar die wit knoppies duidelik sigbaar is.

Alle jong forelle het die siekte opgedoen nadat hulle 'n tyd uit die broeihuis was. Die visse word as besmet beskou sodra die parasiete op die lyf met die blote oog sigbaar word, wat in werklikheid eers twee tot vyf dae na infeksie moontlik is, omdat die jong parasiete te klein is om met die blote oog gesien te word.

Op 25 Augustus was die gemiddelde persentasie besmetting 3·04 met 'n maksimum besmetting in een dam van 17 persent. Onbesmette vis was almal onder een duim.

Aan die begin van die sesioen was 'n dam eers skoongemaak en drooggelaat voordat daar weer vis in geplaas is. (Damme is ronde sementdamme 20 voet in deursnee.) Die metode het gewoonlik 'n dam 'n paar dae lank uit gebruik gelaat. Weens gebrek aan ruimte moes daar egter later 'n ander manier gevind word om damme veilig te maak in 'n korter tyd. 'n Dam is leeggemaak totdat die bodem net bedek is met water en al die afsaksel op die bodem agterbly. Nou word een pond kopersulfaat bygevoeg en goed geroer. Dit gee 'n konsentrasie van ongeveer 1:3,000 kopersulfaat, wat genoeg is om die vryswemmende parasiete en geëncysteerde vorme dood te maak. Nou word die dam 'n paar uur lank met die kopersulfaatoplossing laat staan en dan uitgeskrop en afgespoel met skoon water. Op dié manier is die verspreiding van die siekte vertraag maar kon nie gekeer word nie, aangesien die parasiete op die lyf van die visse nie doodgemaak kon word nie.

"WHITE SPOT" DISEASE IN TROUT

by P. J. le Roux

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(Fauna and Flora Section)

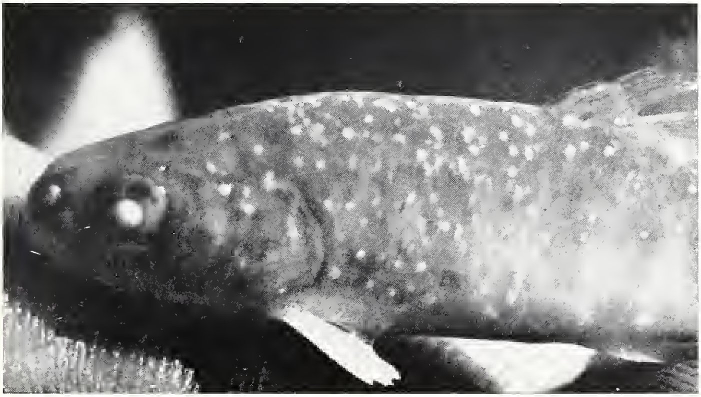
THE parasite *Ichthyophthirius multifiliis*, better known as " white spot ", is a menace to freshwater fish over the whole world. It is a unicellular parasite which attacks all kinds of fish. It occurs on the body, fins, gills and even in the oral cavity.

At fish hatcheries with their large numbers of fish, the disease is a particular danger unless treated quickly and correctly. To accomplish this, knowledge of the life cycle of the parasite is essential.

After the parasite attaches itself to the fish, it penetrates the uppermost layers of skin. After a few days it is full-grown and it then leaves the host and falls to the bottom where it encysts and divides into many smaller individuals. After the division, the cyst breaks open and the small parasites swim about with the aid of their cilia in search of a new host, which they have to find within a few days or die.

In 1952 the disease appeared at the Provincial Fisheries Institute at Lydenburg. The first signs were noticed on 4th August when a few fingerling trout were seen to have the characteristic white spots, about the size of pinheads. These white spots are not readily visible in the rearing tanks and in order to determine the percentage infection, fish are held in a black dish where the spots are easily seen and the number of infected individuals counted.

All young trout contracted the disease after they were feeding for about three weeks. Fish are considered infected as soon as the parasites on the body are visible to the naked eye. This is only possible two to five days after actual infection because the young parasites are too small to be seen readily.



Trout fingerling with white spot disease.

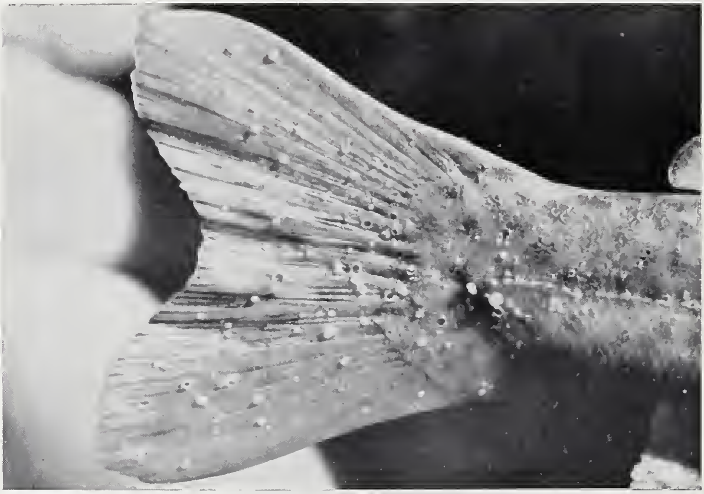
Jong forel met „ white spot "-siekte.

Die enigste doeltreffende manier om die siekte te bestry, is om die vis in vinnig-vloeiende water te plaas sodat die volwasse parasiete weggevoer word sodra hulle van die vis afval en daar dus geen kans van herinfeksie is nie. 'n 200-vt. Sementvoor is spesiaal vir die doel gebou. Deur middel van siwwe is die voor in 'n aantal afdelings verdeel waarin die besmette vis gehou kon word. Die voor se bodem val een voet op elke 500 voet en die spoed van die water is 1·4 voet per sekonde. Dit gee baie goeie resultate.

Die eerste groep vis is na die vinnig-vloeiende water verplaas op 5 September met 'n besmetting van 30 persent. Na 14 dae was hulle skoon en is uit die voor gehaal.

Meegaande grafiek toon die verloop van die siekte in terme van persentasie besmetting by drie toetsgroepe. (Die tyd wat dit geneem het om die visse skoon te kry, wissel baie by die verskillende groepe, wat aan geen plaaslike oorsaak toegeskryf kan word nie.) Dit blyk dat die persentasie besmetting eers vinnig daal, dan styg en uiteindelik weer geleidelik daal totdat die visse skoon is van parasiete. Die eerste daling is waarskynlik te wyte aan die afval van die reeds volwasse parasiete. Dan lyk dit of die visse skoon is omdat die jong parasiete te klein is om met die blote oog gesien te word. Namate hulle dan ontwikkel en sigbaar word, styg die persentasie en wanneer hulle weer volwasse is en afval, daal die persentasie gevolglik. Omdat die moontlikheid van herinfeksie grotendeels uitgeskakel word deur die vinnigvloeiende water, lyk dit of die parasiet in sommige gevalle baie lank in die vel kan bly.

Tot 1 Oktober was daar geen parasiete op die kieue van die aangetaste visse te bespeur nie, slegs op die lyf en vinne. Daarna, soos die siekte vererger het—weens gebrek aan ruimte kon al die vis nie dadelik na die voor oorgeplaas word nie—het die parasiete ook op die kieue verskyn.



Stert van jong forel wat besmet is om die wit knoppies te toon. Let op die gaatjies waar volwasse parasiete die vis verlaat het.

Tail of an infected trout fingerling showing white pimples. Note the pits left by adult parasites leaving the fish.

On 25th August the average percentage infection was 3·04 with a maximum infection in one pond of 17 per cent. All unaffected fish were less than one inch long.

At the beginning of the season ponds were cleaned when fish were removed and left dry before fish were again placed in them. (Ponds are circular cement tanks 20 feet in diameter.) This caused a pond to be out of use for a few days. Because of shortage of space a new method had to be found to make a pond safe in a shorter period. It was drained until the bottom was just covered with water and all the mud and excrement left behind. One pound of copper sulphate was then added and the water well agitated. This gives a concentration of approximately 1 : 3,000 copper sulphate solution which is sufficient to kill the free swimming parasites and cysts. The pond was then left to stand for a few hours with the copper sulphate solution and then scrubbed and rinsed with clean water. In this way the spread of the disease was delayed but could not be completely stopped, because the parasites on the bodies of the fish could not be killed.

The only effective way to combat the disease is to transfer the fish to fast flowing water so that adult parasites which escape from the host are washed away before reinfection can take place.

A 200-ft. concrete furrow was constructed specially for this purpose. By means of screens the furrow was divided into a number of compartments where various groups of infected fish could be kept. The bed of the furrow had a fall of one in 500 feet and the speed of the water was 1·4 feet per second. This gave very good results.

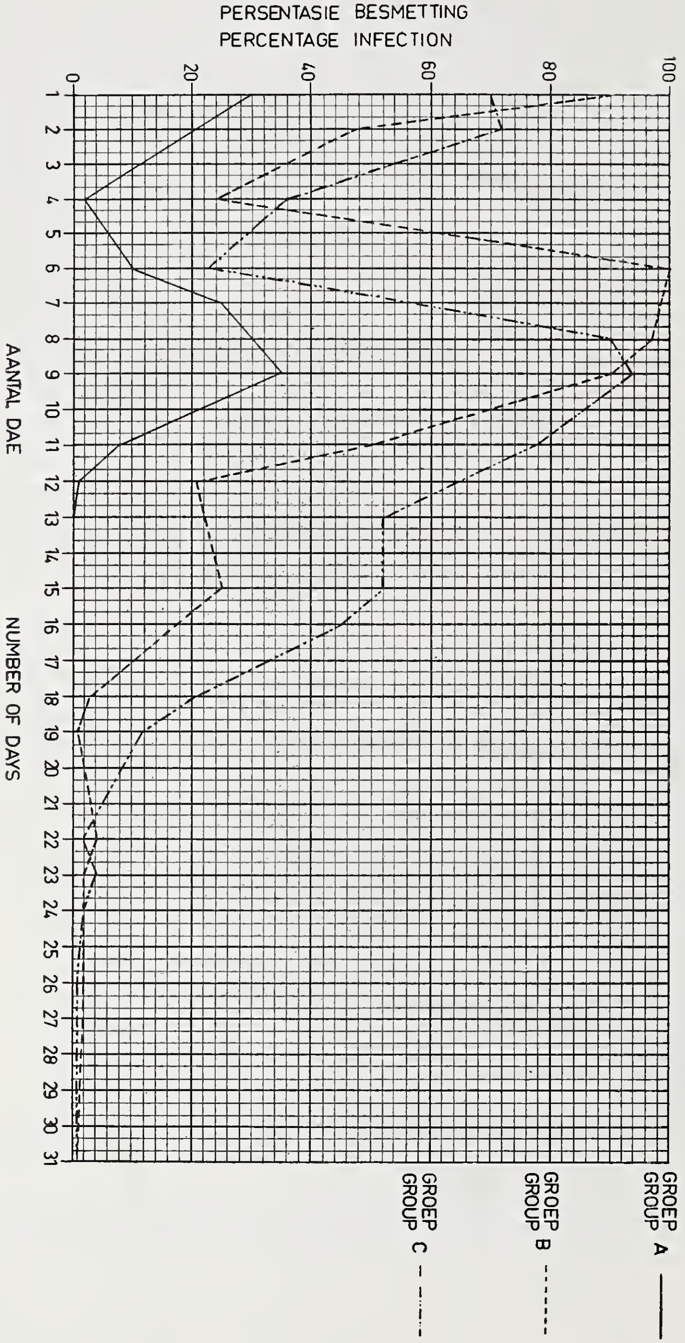
The first group of fish was transferred to the fast-flowing water on 5th September with an infection of 30 per cent. After 14 days they were clean and could be removed from the furrow. The accompanying graph shows the progress of the disease in terms of the percentage infection of three test groups (the time needed to cure the fish completely varied in the different groups, a fact which cannot be attributed to any local factor.) At first the percentage infection drops quickly, then rises and finally there is a gradual drop until the fish are free of parasites. The first drop is probably due to the fact that the adult parasites leave the host and that the younger ones are too small to be seen with the naked eye. As they mature and grow visible the percentage rises and when they are fully adult and leave the host, the percentage drops accordingly.

Because the possibility of reinfection is largely eliminated by the fast-flowing water, it seems that in some cases the parasites stay in the skin for a long period.

Until 1st October no parasites could be seen on the gills of affected fish. After that, as the disease progressed (because of lack of space, all fish could not be transferred to the furrow immediately) the parasites also appeared on the gills.

Then the fingerlings started showing the typical symptoms of a heavy infection. They swam about restlessly near the surface of the water, sometimes with the dorsal fin protruding above the surface, and they frequently jumped out of the water.

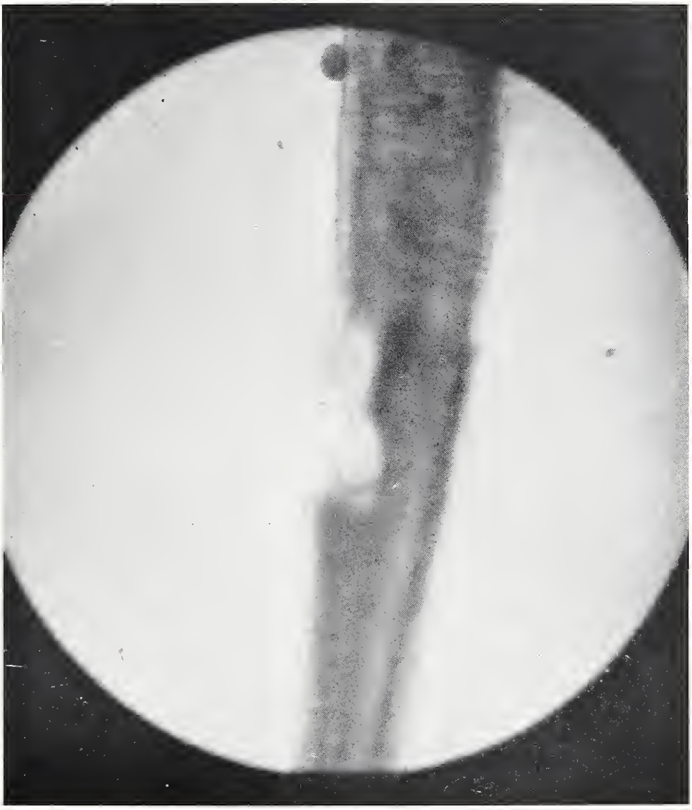
At this stage the disease is dangerous if it is allowed to develop any further. Not only do the parasites interfere with the respiration of the fish but also cause haemorrhage of the gills, which is fatal.


"WHITE SPOT"
PERSENTASIE BESMETTING
PERCENTAGE INFECTION
0
20
40
60
80
100
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
AANTAL DAE
NUMBER OF DAYS
GROEP A
GROUP A
GROEP B
GROUP B
GROEP C
GROUP C

One group in which the gills were exceptionally heavily infected had a mortality of 20 per cent when dipped in a one in 2,000 copper sulphate solution for bacterial infection of the fins.

On 7th October another furrow was put into use and all the fish could be transferred to the fast-flowing water. The disease now decreased rapidly, probably because the parasites developed faster in the warmer weather. On 31st October the average percentage infection was only 3·7 with a maximum of 30 in one group.

The disease occurred mostly among fingerling trout and only in one instance were year-old trout infected. Although two-year-old rainbow trout were constantly exposed to infection, they never contracted the disease. In the running water of the furrows the disease was brought under control and the total mortality due to "white spot" in 1952 was less than one per cent.



Gill arch to show the wound caused where an adult parasite escaped. In the upper middle a parasite is visible on the gill.

Kieufilament om die wond te wys wat veroorsaak word deur die ontsnapping van 'n volwasse parasiet. Bo is 'n parasiet sigbaar op die kieu.

Toe het die vingerlinge die tipiese simptome van swaar besmetting begin toon. Hulle swem rusteloos na-aan die oppervlakte van die water rond, soms met die rugvin bokant die water en spring kort-kort uit die water.

In hierdie stadium is die siekte op sy gevaarlikste indien dit toegelaat word om verder te ontwikkel, omdat die parasiete nie alleen die asemhaling van die vis belemmer nie maar ook bloeding van die kieue veroorsaak, wat fataal is.

Een groep waarvan die kieue buitengewoon swaar aangetas was, het 'n sterftesyfer van 20 persent getoon as gevolg van 'n dip in 'n een-in-2,000 kopersulfaat-oplossing vir bakteriële infeksie van die vinne.

Op 7 Oktober is nog 'n kanaal in gebruik gestel en al die vis kon na vinnigvloeiende water oorgeplaas word. Nou het die siekte vinnig afgeneem, waarskynlik ook omdat die parasiete in die warmer weer vinnig ontwikkel. Op 31 Oktober was die gemiddelde persentasie besmetting slegs 3·7 met 'n maksimum in een groep van 30.

Die siekte het hoofsaaklik onder vingerling forelle voorgekom en slegs eenkeer het jaaroud reënboogforelle die siekte opgedoen. Alhoewel twee-jaar-oud forelle voortdurend aan besmetting blootgestel was, het hulle nooit siek geword nie. In die vinnigvloeiende water is die siekte doeltreffend onder beheer gebring en die totale verliese toe te skryf aan „white spot" in 1952 was minder as een persent.

Dit is egter nie slegs by viskwekerye wat „white spot" so 'n gevaar is nie. Onlangs is in die Vaalrivier by Ermelo en laer-af honderde geelvis, moddervis en babers dood as gevolg daarvan. Die swak toestand van die rivier weens die droogte het ideale omstandighede geskep vir die parasiete. Toe die rivier sterker geword het, het die siekte ook verdwyn.

Ongelukkig kan toestande soos in die Vaalrivier geheers het, slegs verhelp word deur 'n sterk watervloed en kan daar maar net toegesien word hoedat die vis doodgaan sonder dat iets daaraan gedoen kan word.

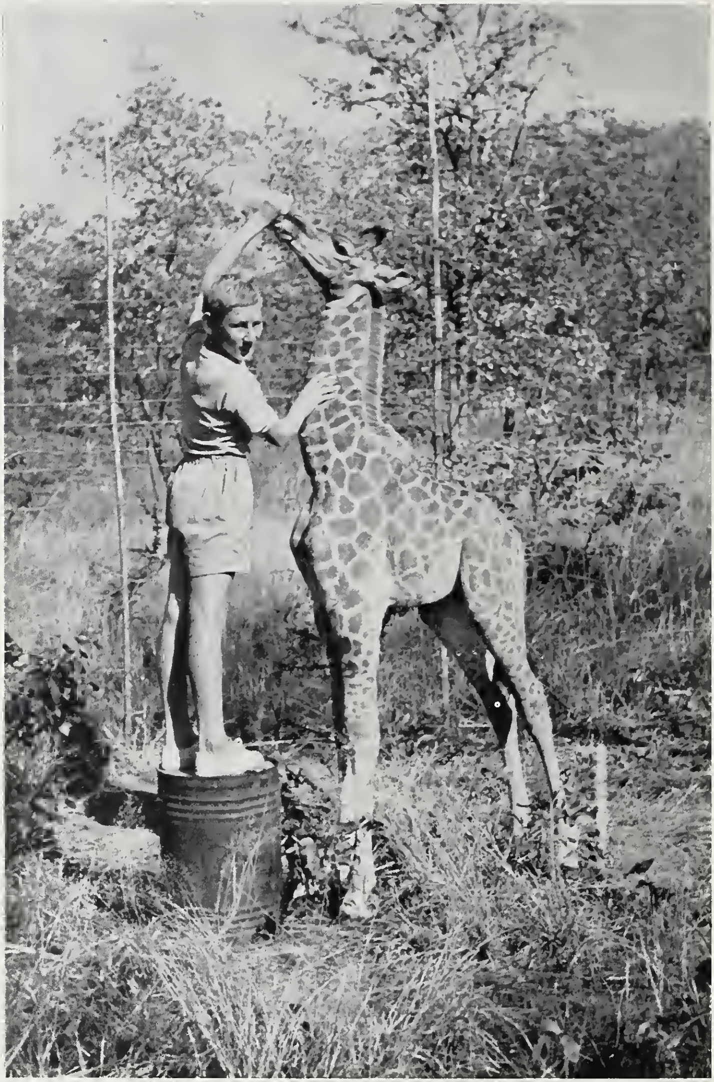
(Photo/Foto: W. F. Schack)

However, it is not only at hatcheries that " white spot " is such a danger. Recently hundreds of yellowfish, mudfish and barbel died in the Vaal River near Ermelo as a result of " white spot " infection. The poor condition of the river, because of the drought, offered ideal conditions to the parasite in the form of standing pools and shallows. When the flow of the river increased after the first rains, the disease also disappeared.

Unfortunately conditions like those which occurred in the Vaal River cannot be remedied except by an increased flow of water and one can only watch the fish die without being able to do anything.

Young Borassus palm with fruits.
Jong Borassuspalm met vrugte.

(Photo/Foto: S. S. du Plessis)



Op die Hans Merensky Provinsiale Natuurreservaat.
On the Hans Merensky Provincial Nature Reserve.

(Foto/Photo: T. J. Steyn)

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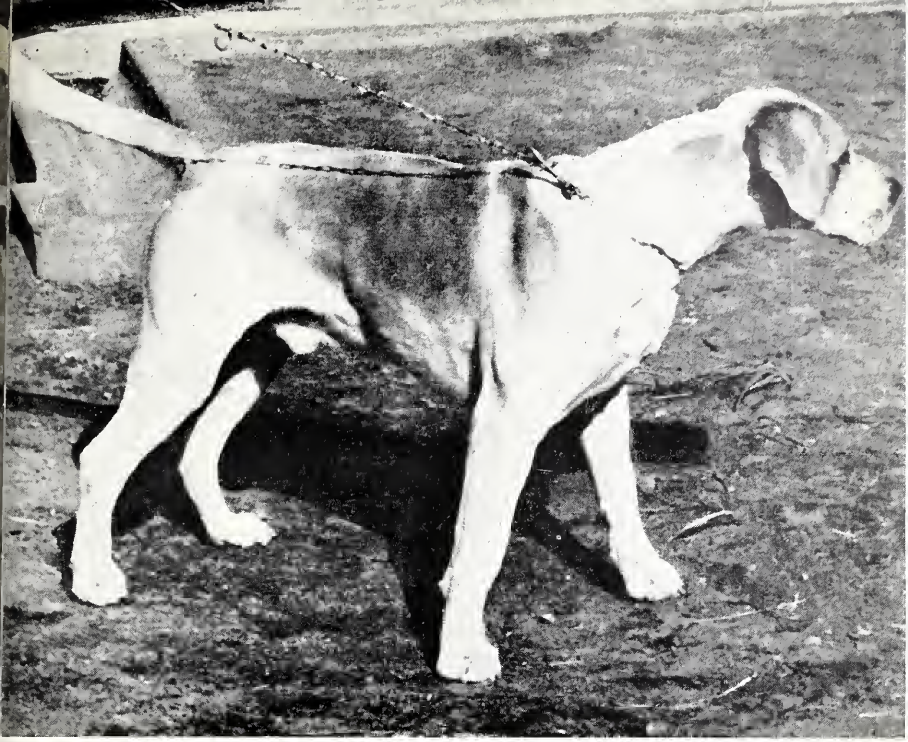

RIFLEMAN (FOXHOUND)

Photo: T. J. Steyn

FAUNA & FLORA

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(Photo: "The Farmer's Weekly")

Start of the hunt.

(Photo: "The Farmer's Weekly")

In full cry.

ADMINISTRATION OF THE PROVINCE OF TRANSVAAL

Administrator
Dr. THE HON. Wm. NICOL

Provincial Secretary
Mr. S. A. LOMBARD

Director of Nature Conservation
Mr. T. J. STEYN

THE JACKAL

by N. J. van der Merwe, D.Sc.

Provincial Game Farm, Panfontein,
Bloemhof, Transvaal

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FOREWORD

IN this treatise the foreign *Canidae* are referred to, for comparative purposes, repeatedly, but the indigenous species are rarely referred to since brief summaries of the latter are also given.

The term " useful " jackal is used frequently and refers in each case to the Silver jackal, Long-eared fox or Delalande's fox, Aardwolf and even the Side-striped jackal. The Aardwolf should, of course, not be classified as a jackal but in view of the purpose of this treatise, this species is also included.

This treatise originates from the need for more specific knowledge of the biology of the jackal since it is thought that by making a comprehensive study of the habits and life-history of the jackal, a weak spot may be discovered, upon which the methods of control of this very harmful animal, may be based.

The material for this treatise was gathered by means of—

(1) a digest of existing articles on the Black-backed jackal;
(2) a compilation of facts, given in replies by farmers and other interested persons to a questionnaire submitted by the writer;
(3) original research, as far as facilities made this possible.

I wish to thank all those, who answered the long, and to them probably, tedious questionnaire, with such thoroughness and Mr. A. J. Hanekom, Sub-editor of " The Wool Grower ", for the publicity given to the questionnaire.

I also wish to express my gratitude to Dr. R. Bigalke, Director of the National Zoo of South Africa, Pretoria, and to Dr. V. FitzSimons, Director of the Transvaal Museum, for access to the libraries of these institutions, as also for valuable help and advice and to Mrs. T. Campbell for her diligence in sorting out information, and for the cover design.

To Drs. W. O. Neitz, G. Theiler and R. J. Ortlepp of Onderstepoort and Prof. D. G. Steyn of the Pretoria University, my thanks for their advice and the identifications carried out by them.

Finally, I wish to thank Mr. T. J. Steyn, Director of Nature Conservation, who by his advice, brought about the accomplishment of this treatise.

It must be mentioned here that this should be regarded, in a great measure, only as the commencement of the work. There are many assertions which will be disputed by scientists and laymen and there are certain aspects, which, in the absence of more knowledge, have been only superficially dealt with.

This work has been undertaken to help the farmer in the control of the Black-backed jackal and therefore deals mainly with the adaptation and habits of the jackal under artificial circumstances, such as found on farms, rather than with its habits under natural circumstances.

N. J. VAN DER MERWE.

Provincial Game Farm, Panfontein,
Bloemhof, Transvaal.
January, 1954.

INTRODUCTION

At present, due to the many contentious opinions expressed on the balance of nature, the whole conception is out of perspective. The idea that perfect harmony reigns where nature is left to herself, or where the natural virginal conditions still exist, is erroneous. There is a balance to a certain extent, but in course of time, one or more of the animal or plant species gain the upper hand, as conditions for that particular plant or animal become more favourable.

With the passage of time, these dominant species increase to such an extent—usually in size as well—that they eventually serve as the means of their own destruction. From the study of rock layers, knowledge has been gained of periods known as catastrophes, i.e. calamitous extinctions of dominant plant or animal kinds. One of the basic laws of biology is that, as expressed by the famous German poet Goethe, specialization is a veiled threat to extinction.

As the history of living organisms is traced from the earliest ages, it is found that during certain periods, specific plants and animals dominated, as the conditions were extremely favourable but that the domination always ended in disaster. Sometimes it meant the total disappearance of that kind whereas less specialized animals or plants continued to exist. Our best examples of this are the extinct reptiles and conifers of the Karroo.

Climatic and other changes may be implicated in these catastrophes to a great extent, but the main factor towards eventual destruction must usually be found in the organisms' own overwhelming development.

It has been maintained that every animal has its own natural enemy which serves as a means of natural control of that animal and thus prevents other animals from being driven from their habitat. Usually every animal has more than one type of natural enemy, but there are a number of other factors which also play an important role: the amount of food at the animal's disposal; the fertility of the animal species; the presence of adequate and sufficient shelter; diseases; ecto- and endoparasites; seasonal changes.

It frequently happens that certain animals thrive in the same limited area as their arch enemies—a phenomenon which can be explained only if one or more of the above-mentioned facts are taken into account. It may even be that the natural enemy may find food on a farm with less effort and thus pay no attention to its normal prey. An example of this is cited by Couch (15) in a description of the Coyote and Jack rabbit, which thrived together to such an extent, that not only the Coyote, but also the Jack rabbit, had to be controlled.

Human beings and their activities will always cause a disturbance in whatever measure of natural balance there may be. It is the task of the biologist to maintain that balance as far as possible, but, unfortunately, the farmer judges his success by the production of his farm and not by the measure of balance maintained. In this the farmer is justified, as he must make his living and as it is also his duty to produce supplies for his fellow humans. It would also place the biologist in an unfavourable light if he were to be more partial to the welfare of nature than to that of his fellows. The farmer should take care, however, that he does not become so subject to the idea of his own welfare and that of his fellow human beings that he creates a new problem for himself. A good example of this is the problem created by the Black-backed jackal.

Unfortunately, history does not record the losses suffered by the Hottentots due to the predatory raids by the Black-backed jackal on their flocks, before the advent of the white settler. Judging by the abundance of food found in the veld at that time, the losses must have been reduced to a minimum.

From many of the answers to the questionnaire sent to farmers, it is apparent that sheep are not the natural food of the jackal, but that sheep-killers have developed a depraved taste. According to Fisher (27) predators change their normal diet only under pressure. Usually they prey on the dominant animal species of the area, but if these disappear, they feed on whatever offers.

Many farmers have found that, as soon as they have exterminated the Black-backed jackal on their farms, by the application of stringent measures, there is a considerable increase, in a comparatively short while, in the numbers of small game such as steenbuck, duikers, etc., hares, rockrabbits, various types of birds—partridges, pheasants and even harmful animals such as rats and mice. This is conclusive evidence that the Black-backed jackal preyed on these animals to a certain extent in spite of it's acquired sheep-killing habits. A similar occurrence according to Goldman (32), was experienced in North America when the Coyote was exterminated in the West. The most prevalent opinion, as given by Atz (3), is that the Coyote is in many respects a very useful animal. Most farmers know that the greatest losses to their flocks occur during the mating and breeding seasons of the jackal. Consequently, there is a period when the jackal lives mainly on veld food and a period when it is not solely dependant on sheepkilling, but finds supplementary food in the veld. The food which it finds in the veld must be regarded as buffer-food.

Another factor which must be taken into consideration is the ousting of the larger predators by civilization. In it's natural state the Black-backed jackal was to a great extent a scavenger. Stevenson-Hamilton (81) and FitzSimons (29) both describe the habit of the Black-backed jackals of gathering round the carrion. It is well-known in South Africa, especially in the Kruger National Park, that the jackal follows the lion's tracks, to satiate itself on the remains of the kill.

There are many reasons for the disappearance of the buffer-food of the Black-backed jackal: the hunter, and especially the night hunter, killing injudiciously; the farmer, with disproportionate neatness, clearing all possible shelter for game and birds, especially by means of veldfires; but the chief sinners are those, who under pretext of exterminating jackals, destroy many other useful little animals. Those using poison indiscriminately are chiefly to blame for this offence.

At this stage it is sufficient to note that if the buffer-food of the Black-backed jackal disappears, no matter how or on whose responsibility, the jackal will be impelled by hunger to kill sheep. To use a hackneyed term, the farmer has moved into the jackal's territory and not the jackal into the farmer's territory. The Black-backed jackal is a domiciled creature and will leave its old haunts only if the persecution is merciless.

One of the most important contributory factors which has caused the Black-backed jackal to become a pest, is the half-hearted manner in which methods of destruction have been applied. When a few jackals have been destroyed, matters are usually allowed to rest there. It must be realised that the few that are caught are usually the old jackals, the diseased, the weaklings, the stupid or the young jackals. The wary, strong and healthy jackals are not so easy to destroy. These, true to nature, will breed wary, strong and healthy jackals and the litters will usually be large. It boils down to this: that in South Africa we have bred a vigorous jackal.

A Black-backed jackal, having once picked up poison and having got rid of it by vomiting, will never, if it survives, eat poisoned bait again. If the bait had been prepared properly it would have proved fatal. A jackal parent, having experienced this, will growl and even bite its young to warn them of this danger. In this way the young jackals soon learn to avoid poisoned bait.

A Black-backed jackal, having once escaped a poorly-set trap, will only by exception, be caught again. A jackal cornered by inadequately trained dogs in front of a fence and successful in escaping over the wire, will never allow himself to be caught in that way again.

It is true that no sheep farmer, on discovering a burrow with a jackal litter, will pass without destroying them, but the numbers of the jackals would have been greatly decreased if each farmer made weekly raids on every possible burrow during the breeding season. The clubs responsible for the destruction of jackals, should also carry out raids on the young jackals in the burrows. The time-honoured grievance that the Black-backed jackal breeds on a neighbour's farm, especially if the latter is a cattle farmer should not apply. It would be an extremely unreasonable neighbour who would refuse permission to destroy jackals and who would not be prepared to help. According to the Transvaal Vermin Destruction Ordinance (1949), the neighbour is obliged to help should his farm lie within the club's area, and he may, in addition, be held accountable for part of the expenses. The cattle farmer also knows that the Black-backed jackal makes short shrift of newly-born calves.

The Black-backed jackal, as it is known today, is a pest and problem which must be tackled in earnest. It is doubtful whether this jackal will ever play a useful role in nature again, but if it can be exterminated or its numbers reduced to such an extent that it can no longer be regarded as a pest, care must be taken that the mistake of inadequate and faulty methods of destruction, is not repeated. The second error may be worse than the first.

If we mean to remove the Black-backed jackal, we must protect the other kinds—the Silver jackal, the Side-striped jackal, the Aardwolf and the Long-eared fox. This point of view was expressed by Du Toit ([24]) in 1904 and recently repeated by Meester ([50]). It is true that the former three kinds may also become depraved and kill lambs, usually because there is little or no food to be had in the veld, but if care is taken that birds such as partridges, pheasants, bustards, etc., as well as hares, steenbuck and other small game are not destroyed indiscriminately, the danger that these jackals will kill lambs is slight. It is well known that some sensible farmers allow the Aardwolf among their flocks, but then they are secure in the knowledge that there is sufficient food for the Aardwolf on their farms. It may even be necessary in the future for farmers to resort to the artificial importation of small game and birds. It is important that only the sheepkiller among the useful jackals should be dealt with, even though this may take time and trouble and give rise to expense, since the sheepkiller can easily teach others its habits. Inexplicable to the biologist is the fact that farmers persecute and destroy one of the most useful animals on their farms, viz., the Long-eared fox.

The lesson to be learnt from what total destruction of all jackals may mean, can be found in the experience of the Karroo farmers. Once the jackals had been destroyed, the rockrabbits migrated from the mountains to the plains, to the detriment of the veld. Unfortunately, many of the larger hawks and eagles were also shot, without it being realised that these were the only enemies left to keep the rockrabbits in check. A similar problem has also arisen in large areas in the Transvaal, but in this case the ground squirrels and springhares have got out of hand. One correspondent found that in his zeal to destroy all jackals on his farm, he had also destroyed ant-bears in the burrows with the poison gas he used, with the result that the ants, unchecked, pillaged his veld. The ill-considered distribution of poison can cause the destruction of useful little animals such as weasels, yellow mungooses and useful jackals, with the result that there are no scavengers left to remove the carrion. If there is a sudden eruption of the blue-bottle plague on the farm, it is not connected with the careless distribution of poisoned bait. Of this Bigalke (¹⁰) writes: " Even if the rockrabbit plague is—not solely due to the disturbance created by humans in the conditions of nature, there is little doubt that it stands in close relation to this ".

The whole problem eventually reverts to the idea of the balance in nature. The farmer who manages his farm intelligently, can more nearly attain a real balance than is possible in nature herself. It is no easy task to overthrow established ideas. To the sheep farmer, who has suffered losses, the jackal remains a jackal and must be destroyed. The farmer will not readily admit that he bears responsibility for the breeding of a super-jackal and that, by his methods of destruction, he may be causing new plagues, but this fact cannot be denied. In the future attempts must therefore be made to create an artificial balance.

It is absolutely essential that the Black-backed jackal should be exterminated in the sheepfarming areas, but the other types of jackals must be protected and only the sheepkillers among them destroyed. Veld, where wild animals, especially the various types of birds, will be protected, must be made available, even at the cost of diminished flocks of sheep. The protected game will multiply so rapidly that the farmer will later be obliged to hunt them discriminately. If the game have disappeared from the farm, they will have to be imported, but only when provision has been made for sufficient food and adequate shelter. Before a farmer introduces any such animals on his farm, it would be advisable to consult a biologist to prevent the introduction of a foreign kind which may easily, by getting out of hand, prove a new type of pest. The rabbit plague of Australia is probably the most commonly known example of an error of this type.

The extermination of the Black-backed jackal can be tackled in earnest if all farmers, not only sheep farmers, were to co-operate to attain a balance on their farms, as well as throughout their entire districts, for this would mean that other animals would take over the little useful work done by the Black-backed jackal. If this co-operation cannot be achieved, the patchy and ineffectual methods of destruction must continue with the resultant deterioration of conditions.

Unfortunately, some farmers, when confronted by a problem, are inclined to expect the Government or the Provincial Administrations to help them out of their difficulties. Since as yet, there are neither the facilities nor the staff for the destruction of the Black-backed jackal, the farmers, if they are in earnest, will have to tackle the problem themselves and they will have to help one another.

One method by which to commence, is an intensive campaign against the litters still in the burrows. The normal breeding seasons are known in each area and during those times the vermin clubs must concentrate on the destruction of the litters. If no club is in existence, neighbours must co-operate.

Care, should, however, be exercised to ensure that the extermination campaign does not involve the destruction of ant-bears and other useful little animals; in other words, it should first be ascertained whether the inmates of the burrows are jackals. It is extremely important that the burrows should be investigated regularly during the breeding season. One investigation is not enough, as a pair of jackals often breed twice during the season and if they feel safe will make use of the burrow a second time.

Equally important is the fact that the burrows on the neighbouring farms should also be investigated. If the jackal does not interfere with the neighbour's farming activities, it would be too much to expect that he should be responsible for the jackals' destruction. It is in the sheepfarmer's interests, however, that the destruction should be carried out and thus, with his neighbour's permission, he should undertake this.

If the farm is bounded by crown lands and these are suspected of being the breeding grounds of Black-backed jackals, the necessary permission must be obtained to clear these areas as well.

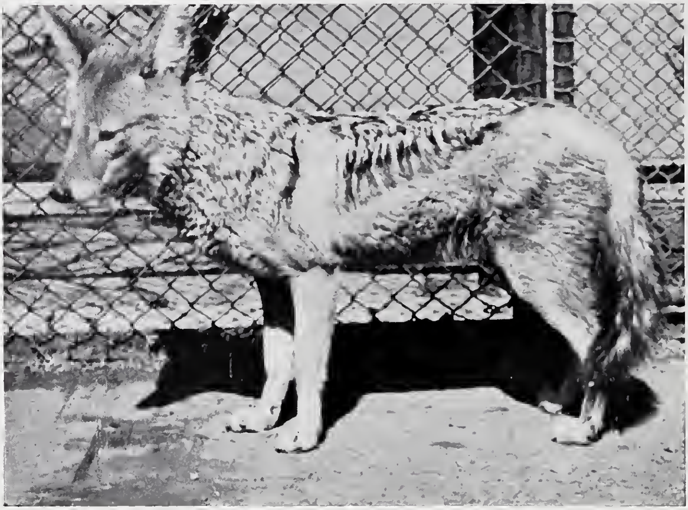
In concentrating on the litters, the destruction of the adults should not be neglected. The campaign against them should be continued as usual, the destruction of the litters being additional. A jackal bitch prefers to pup in a burrow, but if this cannot be found any shelter serves as well.

To summarise—no biologist or nature lover will ever advise the total extermination of any animal kind. As yet, little is known of the Black-backed jackal and it would be a mistake, from a scientific point of view, to exterminate totally any animal kind, no matter what the reason. In North America Dice (17) advocates that the equally harmful Coyote should not be wholly exterminated. But as has been repeatedly mentioned here, the sheep-killing jackal is an almost artificially bred jackal, and as such, of little use for research. Fortunately, there are still large areas in southern Africa where the Black-backed jackal still pursues it's natural life and will probably never be exterminated. According to Goldman (32) the position of their relatives, the Coyotes in North America is the same. For the sheep-killer, however, having lost his use in evolution, there is no longer reason for existence and it has become, as expressed by FitzSimons (29), one of the animals on whom death sentence must be pronounced.

CHAPTER 1

The Black-Backed Jackal

[*Thos mesomelas mesomelas* (Schreber).]



Black-backed Jackal.

Three sub-species, according to Shortridge (73) are recognised:—

(1) *Canis mesomelas* Schreber.
Type unfortunately no longer in existence, originally from Cape Province.

(2) *Thos mesomelas arenarum* Thomas.
Type in the British Museum, originally from Berseba, Great Namaqualand.

(3) *Thos mesomelas achrotes* Thomas.
Type in the British Museum, originally from Rooibank, near Walvis Bay, South West Africa.

Common names:—

Afrikaans: Blourug-, saalrug-, silwerrug-, silwer-, rooi-, grootrooi-, witrug-, bontrug-, vos of vossie.

English: Black-backed, Saddleback, Silver, Silvertail, Silver-back, Red, Golden.

DESCRIPTION.

According to Hewitt (41) the Black-backed jackal's body length, i.e. the head and trunk, is 39 inches and the tail 14 inches long. In the measurements given by Drake-Brockman (23) for the Black-backed jackal found in Somaliland the body length is considerably shorter, viz., 27¾ inches, but the tail is only ½ inch shorter. The adult jackal measures about 19 inches at the shoulder and weighs roughly 20 lb.

As described by Roberts (65), the black and white saddle-shaped marking on the back is the most outstanding external characteristic. This saddle extends from the back of the head to the tail and is clearly defined against the rufous colour which is typical of the head, flanks, the fore- and hindlegs. The throat or gular, the chest, the belly and groin regions are white. The brush is of a light brown colour, having some black-pointed hairs, and terminates in a black tip. The black and white saddle is broad across the shoulders but becomes increasingly narrower towards the lumbar region until it tapers to a point at the crown of the tail. Very characteristic also are the fairly long, triangular, pointed ears.

The Black-backed jackal is known by a great variety of names. In Afrikaans: Rooi-, blourug-, swartrug-, saalrug-, silwerrug-, silwer-, grootrooi-, witrug-, bontrug-, lammervanger-, vos of vossie. In English it is known as: Black-backed, Saddleback, Silver, Silvertail, Red, Silver-back and Golden. It is evident that most of the names are derived from the characteristic saddle.

The Black-backed jackals hunt singly or in pairs with their cubs but seldom hunt in packs. Shortridge (73) reports that during droughts in South West Africa, Black-backed jackals run together in packs of ten and there have been similar experiences in the Kalahari, but under normal conditions this does not occur. Lone jackals are prone to gather round carrion but having gorged, will disperse [FitzSimons (29)].

The Black-backed jackal prefers the open veld, provided there is a certain amount of shelter, over and above the possibility of taking cover in burrows. As recorded by Roberts (64), the adult jackal finds life safer above ground and selects lookouts and hiding places on slopes and rises from where approaching danger may be seen in time. Frequently, if caught unawares, the jackal will remain motionless, in the hope that its presence will not be detected and the danger thus be averted. If warned of the threatening danger in time, it will steal away quietly.

Sclater (69) and many other writers have confirmed that in densely populated areas the jackal is a nocturnal animal. It is usually to be seen at sunset, when it sets out on its nightly hunting raids or at daybreak, just before sunrise, when it returns. In the more sparsely populated regions, it may set out earlier and return later. Bigalke (9) states that in the Kruger National Park the jackal does not differentiate between night and day.

The Black-backed jackal has exceptionally well-developed senses and when hunting, makes use of all the senses, which, according to FitzSimons (29), are greatly sharpened. In so far as it can be established, it seems as if the jackal depends mostly on its sense of smell. It is common knowledge, that on becoming aware of something the jackal will approach from down-wind and try to ascertain, as far as possible, what the object is. Its hearing is good, but it appears as if its sight, although sharp, is the sense on which the jackal relies least. Like any other living creature, the jackal finds it difficult to descry any motionless object and thus be warned in time. This may account for its choice of lookouts, during the day, on rises from where anything moving in the distance may be seen in time.

It is a characteristic habit of the jackal that, while out hunting, it travels some distance before it begins to howl. Its cry has been described and imitated onomatopoeically by various writers. Sclater (69) describes the cry as a wailing laugh, Shortridge (73) as a yelping bark, Stevenson-Hamilton (81) as a shrill, recurrent " ieaaaa-iea-iea-iea-iea ", and Bryden, quoted from Shortridge (73) as a long drawn-out howl interposed by short, yelping sounds. The long cry " nieaaaa, niea, niea, niea, niea ", is recorded by Roberts (64) to be the sign to come together. When startled, the jackal yelps like a dog and when cornered, emits a sound best imitated as " kê-kê-kê-kê-kêk ". If the jackal becomes aware of danger, especially if there are cubs in the vicinity, it gives vent to a soft " wuf ". Roberts (64) describes the cries during mating season as fairly pleasing. The bitch usually emits a shrill, but hearty laugh while the male answers with a deep, long drawn-out howl. Menace of dogs is greeted by a growl. Jackal families out hunting together maintain contact by calling to one another. According to Roberts (64) it may be safely assumed that there are cubs in a burrow when the call of jackals is heard in the neighbourhood on consecutive evenings. If the bitch deems it necessary to call the cubs from the burrow, she gives a deep growl [FitzSimons (29)].

When hunting, the Black-backed jackal prefers to follow footpaths and roads and it's pace is a dog-trot of about 5–6 miles per hour. [Roberts (64).] The distances covered by a jackal in one night are astounding. It is commonly known that the jackal prefers to raid a neighbouring farm, but if the sheep are further away than this, it will traverse a number of farms to reach them. Roberts (64) cites a case where a jackal was killed and grapes found in its belly though the nearest vineyard was 25 miles distant. The route covered in one night naturally depends on the amount of food available and its own hunger and that of the cubs. The speed of the return journey is determined by the lateness of the hour and whether the jackal has gorged itself or not.

The Black-backed jackal is depicted as cowardly for various reasons by so many writers that it must be accepted as being the case, but, on the other hand, there are cases cited by correspondents, where, when at bay, the jackal fights courageously. There are even cases mentioned where dogs have been attacked and killed by jackals. [Jansen (44).] It is not to be denied that it is wily, cunning and very cautious. The jackal prefers to evade the issue, if possible, knowing that it will be worsted by a pack of dogs. It fears its natural enemy, the leopard, and shuns it in every possible way.

Mating takes place in Autumn and the pups are whelped during the latter part of winter or early spring. Burrows are used during the breeding season, but these are seldom dug by the Black-backed jackals as they customarily occupy the dens of the aardvark and other burrowing animals, merely enlarging and cleansing these. The litters average from five to seven cubs and for the first three days the bitch remains in the burrow constantly, but from that time until the tenth day, she stays there only during the day and hunts by night. After the tenth day she enters the burrow only to suckle her young. Similar to the dog bitch she eats practically nothing during the first couple of days.

The jackal cubs, like other small animals, are very playful and at 14 days begin to play outside the den. Footpaths are worn to the nearest antheap or bush by their constant running to and fro and places where they have played may be noticed round the opening of the burrow. Old pieces of skin, bones and feathers and the places where they habitually defaecate and urinate, always betray the presence of cubs in a burrow. If the birth-den is discovered the parents will pick them up like kittens and carry them to another burrow but if they are 14 days or older they will join their parents in the veld.

At the age of 8 to 10 months the young jackal is able to care for itself and as time passes will wander away from the parents. If this does not occur, the bitch leads them to another area and there tries to lose them. If this is not successful, she resorts to driving them away by biting and growling.

Roberts (64) states that in recent years the Black-backed jackals have multiplied very rapidly. As discussed in the introductory chapter, many reasons can be suggested for this abnormal increase but the methods of destruction in South Africa have certainly played the greatest part. It has already been pointed out that only the most virile and cunning jackals survive the persecution and that such animals usually produce large litters. Cahalane (13) describes something similar in the case of the Red fox, which in spite of being continually hunted, still exists and has only become more cunning. Nature, however, avoids over-population by means of inbreeding, which has a retarding effect on the rapid increase of an animal kind. Rice and Andrews (63) cite tabulations of rats and mice in which research has proved that inbreeding decreases fertility in mice but also gives facts that certain rats are not affected by this. According to Branston (11), Lush (48), Rice and Andrews (63) and Hagedoorn (36), inbreeding can be applied to domesticated animals with good results, but on condition that it is done scientifically, otherwise it is doomed to failure. Branston (11) particularly warns against inbreeding in nature as it can have most detrimental results such as faulty characteristics not only being repeated in the progeny but also doubled. Buck, especially springbuck, which have been fenced in for years show the injurious results of this, as they are considerably smaller in stature than those which have moved about freely and been able to outbreed. Under normal circumstances it is usual for Black-backed jackal bitches and dogs of the same litter to mate. Methods of destruction cause such a wide dispersal of jackal families that the survivors of one litter have to mate with those of another. Thus, the limiting factor of inbreeding is practically artificially excluded, due to interference by man.

The fact that the Black-backed jackal adapts itself so easily to changes in its surroundings, shows that in certain aspects it has not yet attained specialization. This lack of specialization means that it has better prospects to survive as a kind and to multiply. The problem which thus arises is that unless the Black-backed jackal can be exterminated the life of the sheepfarmer will be rendered almost impossible.

DISTRIBUTION

The Black-backed jackal is fairly generally distributed throughout South Africa today and there is every reason to believe that this has always been the case. According to Roberts (65), FitzSimons (29), Stevenson-Hamilton (81), Miller (51), Lydekker (49), Drake-Brockman (23) and Shortridge (73), this general distribution extends throughout Africa. It is true that there are certain limited areas where from two to fifty years ago, Black-backed jackals were unknown, but unfortunately, at this stage it is impossible to find the reasons why the jackals did not frequent those areas at that time. Goldman (32) and Dixon (20) describe a similar migratory phenomenon of the Coyote in North America.

An area from which the Black-backed jackal has been absent until quite recently is the eastern Highveld of Transvaal. It can only be surmised that the larger predatory mammals such as leopards and cheetahs, or birds of prey or perhaps disease had driven the jackals from this area. A disease such as Rabies could have exterminated them completely. Lack of food and adequate shelter could also be reasons for their absence formerly, but whatever the reasons may have been, they no longer exist, for the Black-backed jackal is now found in this part of Transvaal. As cattle farmers generally take little heed of jackals, it may be that the jackals have been present in this area for a longer while than is surmised and that it is only with the advent of the sheep farmer in these parts that their presence is more especially noted.

In other regions, for instance districts of the Great Karroo, the Black-backed jackal has been almost entirely exterminated by intensive measures of control. Those jackals not destroyed were driven from these districts by rigid persecution, but where vigilance has lapsed and where proper precautionary measures have not been taken, especially with regard to the upkeep of the jackal-proof fencing, the Black-backed jackal has returned. It remains a constant necessity, therefore, to destroy those which have penetrated.

External factors such as droughts and scarcity of food have a definite influence on the migratory tendencies of the Black-backed jackal. Usually they thrive during times of drought when the sheep die of hunger. They follow the " trek " farmer at a distance and prey on the weaklings of the flock. In this manner the jackals enter new areas and the distribution extends.

Cold, and generally bleak weather, rather than causing the migration of the jackal, serves to sharpen it's appetite and on such cold days it often kills during daylight. In the Highveld of Transvaal the Black-backed jackal frequently makes its kill on misty days. In contrast to this the farmers in this region have found that during a year of good rainfall, with the resultant abundance of veld food, they suffer fewer losses due to jackals.

Although nowadays many farmers assume that the Black-backed jackal has always been a sheepkiller, evidence of many of the older generation, is to the contrary. In earlier times the jackal preyed on the smaller types of game, birds, hares, mice, etc., but when these decreased in numbers or disappeared, because they had to be destroyed for various reasons, the Black-backed jackal was forced to kill sheep. As the larger predatory mammals had to be destroyed the chances of finding carrion, on which the jackal could feed, became less. For the Black-backed jackal sheepkilling was much easier and the meat perhaps more appetising than that of animals of the veld. It can thus safely be assumed that the jackal, which has become a sheepkiller will migrate to those areas where it will find the prey to which it is most partial.

The Black-backed jackal occurs in areas other than sheepfarming districts and here it must be content with food found in the veld. Here, also, as it does not come into conflict with the activities of human beings, unless it kills poultry or calves, the numbers of the jackals increase rapidly. Thus when, due to lack of food or in the case of over-population, the necessity arises to migrate, it is found that the jackal frequently enters sheepfarming districts in this manner. It commonly occurs in areas, newly proclaimed as Native territories, that the Natives strip the veld to such an extent that the jackal is forced to give way, as in addition it is hunted by the dogs of the Natives. It is generally known that even birds are not to be found in the Native territories.

An important factor is, as already discussed in a previous chapter, that poor methods of destruction, have caused the breeding of a super jackal race in which big litters are common. This also causes over-population among the jackals and some must of necessity leave the old haunts.

The Black-backed jackal has a strongly-developed sense of habitat. Once a pair of jackals have moved into an area they are inclined to remain there permanently. Their right to this will not be contested by other jackals and it seldom if ever occurs that a second pair of jackals will take up their abode in the immediate vicinity. Cubs bred from the original adults, will, when the time comes, migrate on their own or be driven away by the parents. Exactly the same habit prevails among the Coyotes according to Cahalane (13). It is obvious that the more food available, the greater the number of jackals in that area will be. Newcomers always select an area where there will be sufficient food and adequate shelter for them.

When a pair of Black-backed jackals move into an area previously frequented by other jackals, but which have been destroyed or driven out, they will settle in the same neighbourhood as their predecessors. They will even make use of the old den.

A factor, which to a lesser extent affects distribution, is the death of one of a pair. If the bitch is killed, the male will leave the neighbourhood, provided that there are no cubs for which to care. As soon as he has found another mate, in the case of a young bitch, the pair will select a new habitat. If the second bitch is one which has been robbed of her former mate, the pair will remain in the area frequented by the bitch. The case of a bitch is just the opposite, as she will lure the male to her, i.e., if she is not in pup or has cubs for which to provide. She remains in her old haunts unless she is a young bitch.

The Black-backed jackal is quick to realise when human occupation has rendered safety for it in a new area. The farmers of the lowveld of Transvaal found that the jackals had moved in as soon as all the leopards and cheetahs had been killed.

It is interesting to note how rapidly the numbers of the other kinds of jackals increase, especially the Long-eared fox, the Aardwolf and the Silver fox, when the Black-backed jackal has been exterminated in an area. According to Dixon (19) and Goldman (33) the biologists in North America have a difficult task when pleading against the indiscriminate killing of the Coyote, as fur trappers have found that the Coyote is responsible for the destruction of large numbers of fur-bearing foxes.

Bigalke (9) has suggested that it may become necessary to capture and tag a few Black-backed jackals and by setting them free once again, to try to trace their migratory habits. For the research worker this is apparently the only means, but then the experiment must be conducted in areas where the Black-backed jackal is still to be found in its natural state, as conditions for the sheepkilling jackal will be different because, it can be safely assumed, that the latter's movements are affected by the presence or absence of sheep.

Goldman (32) states the fact that the Coyote has exceptional means of adapting itself to conditions, as created by man, and that in the past few years it has penetrated into areas where it was previously unknown.

The same writer also records the fact that Coyotes trail game, ousted from their original surroundings by man, and that they follow flocks of sheep brought to new areas.

It is thus apparent that in this aspect also there is great similarity between the Coyote and the Black-backed jackal, since the latter also speedily adapts itself to man-created conditions and, as already mentioned, is quick to reap the benefit of safe areas, where man has destroyed its natural enemies. The Black-backed jackal which has become accustomed to killing sheep, follows the farmer when he treks with his flocks but there is no record in this country of a jackal trailing migratory herds of game.

HUNTING AND FEEDING HABITS

Under normal circumstances the Black-backed jackal's manner of hunting differs considerably from the method used if it has become addicted to sheepkilling. After cautiously and stealthily stalking a sleeping crane, pheasant or any other bird, it pounces on it and in the same manner it attacks other birds such as the bustard nesting on the ground. If the bird is warned of the danger in time the jackal rushes forward and snaps at the flushed quarry. Encountering possible prey during the day, while resting, it waits motionlessly until the animal is close, before it makes it's kill. Jackals have been known to keep watch for hours during the night in front of springhare earths until one rashly emerges. Roberts (65) tells of cases where one jackal stood guard outside a clump of bushes while others entered the undergrowth to drive out the prey. Another case mentioned is of one jackal laying open the holes by digging while the others captured the escaping mice. This way of catching mice is similar to the methods used by the Coyote, described by Dobie (22), and by the Red fox, recorded by Smith (77). Like it's North American relative, the Black-backed jackal pounces on the mice and it may be assumed, according to Roberts (65), that it stalks and pounces on all the slower types of smaller animals.

When the jackal tracks bigger animals, such as the smaller types of buck, the victims are pursued, overtaken and killed. This method corresponds with that used by the Coyote [Skinner (76)] and the North American wolf [Flower and Lydekker (30)]. The same method is used for killing a sheep.

The Black-backed jackal, as verified by many of the correspondents, has not always killed sheep. This has been the case only during the past 30 to 40 years and there are territories where the sheepkilling began only a few years ago.

Shortridge (73) maintains that the Black-backed jackal of South West Africa has become addicted to sheepkilling because of the disappearance of it's natural food in the veld. According to correspondents the same is the case in South Africa.

The habit of trailing the lion in order to gorge on what was left of the lion's kill, has disappeared with the lion. The Black-backed jackal was a recognised scavenger. [FitzSimons (29), Stevenson-Hamilton (81) and Roberts (64)]. In this it is similar to the Coyote, according to Westell (84). As already mentioned, the injudicious methods of destruction have destroyed other scavengers such as weasels, yellow mungoose, useful jackals, vultures and others, so that pests, resulting from the carrion left lying about, have come in place of the Black-backed jackal.

Where there is still sufficient food in the veld for the Black-backed jackal, few sheep are killed, except perhaps during the mating and breeding seasons or if there is a exceptionally depraved sheepkiller. Unfortunately, there are many reasons for the disappearance of the jackal's natural food:—

(1) Farms have become smaller and birds and animals have had to find shelter elsewhere or have been destroyed.
(2) Hunters, lawfully or unlawfully, have pillaged large territories to such an extent that there is not sufficient food even on the bigger farms.
(3) Droughts facilitate the killing of sheep by the jackal but render the capture of it's normal prey more difficult due to the lack of cover which also causes the game to migrate.
(4) Roving dogs, especially those of Natives, have pillaged large areas to such an extent that very little remains for the jackal.
(5) Intensive farming diminishes the chances of survival and of rapid increase of the smaller veld animals, with the result that the buffer food of the jackal disappears.
(6) Veldfires destroy and drive out the inhabitants of the veld.

If it is still further taken into account that sheepkilling is much easier for the jackal than the tiring pursuit of a fleet buck, it can be realised how easily depraved tastes can be developed.

Among the above-mentioned are factors such as the decrease in the size of farms, droughts and inclement weather to which little can be done, but the other reasons need serious attention. The disgraceful extermination of smaller game and birds on farms, especially on those of wealthy landowners is to be condemned. Even where it is necessary to farm intensively, suitable places where bush and undergrowth will provide breeding facilities and shelter, can be left unhindered for the useful animals of the veld. Guinea-fowl, bustards and pheasants, etc., not only serve as a buffer-food of the Black-backed jackal, but also destroy countless insects and insect larvae. Damage and loss caused by birds and smaller game are not of such magnitude that the farmer will be driven from his land.

From the facts given by correspondents, it can be seen that it is only by exception that smaller game such as steenbuck, duikers, etc., and birds such as partridges, lapwings, etc., do not increase considerably in numbers after the Black-backed jackal has been exterminated on a farm. In most cases, too, it was found that harmful animals like rockrabbits, hares, springhares, mice, rats and ground-squirrels had multiplied so rapidly as to become a new menace. The trouble lies in the fact that the useful jackals and birds of prey which would have played their part in keeping down the numbers of the harmful animals, have also suffered by the methods of destruction employed.

As has already been stated, the Black-backed jackal finds it very easy to kill sheep, for the latter become so bewildered when danger threatens that they are easy victims. Wool sheep are even more easily captured than mutton sheep, as they are inclined to scatter widely when danger threatens. In contrast, mutton sheep are stronger runners and usually bunch together when in danger. Lambs of five to six months are the chosen victims of the jackal and next to these it prefers ewes and young wethers, but it does not attack rams and fully-grown wethers as these, especially the rams, may fight back. It has a predilection for kids, but the adults are left in peace.

The depraved jackal does not always kill only to still hunger, but seemingly on account of a bloodthirsty craze, as frequently more sheep are killed than it can possibly feed on. Young jackals which have just learnt to kill are usually guilty of these orgies. It is interesting to note that there are no existing records of such killings under normal conditions, such as a jackal having killed a number of hares and then not having fed on them. It would seem as if the desire to slaughter is only experienced among a flock of sheep. According to Henderson (^{39}) the Coyote manifests the same cruelty. Cahalane (^{13}) is of the opinion that the Coyote, suffering from some physical disability, such as those with worn teeth or those crippled in traps, are responsible for killing a third more sheep than the normal Coyote.

It would seem as if the older, Black-backed jackals also indulge in this slaughter during the mating season and just before the breeding season. As suggested previously, a possible reason for this is that the jackal parents wish to make provision for sufficient food for the time when the cubs will be whelped.

It would appear that the indiscriminate killing does not always satisfy the bloodthirsty craving, as frequently the jackal begins to feed before the sheep is dead. The sheep is usually helpless due to stupidity and loss of blood and is thus slowly tortured to death. Old jackals, too weak to make a kill, are generally the culprits in this case.

Frequently sheep, especially if they are strong runners, are able to escape their enemy, but then generally the hindquarters are torn or the tail wrenched out. One correspondent tells of a case where a Black-backed jackal chewed out the anus of a sick cow while she was powerless to defend herself. Sheep and even lambs, escaping from jackals, arc often choked to death by haemorrhages under the skin, caused by wounds to the neck.

The Black-backed jackal seldom kills in thickets, preferring to wait until the flocks have moved out into the open veld. It will never ambush a sheep. Usually the quarry is hunted at night, but when driven by hunger, it will kill in broad daylight. During bad weather it will venture into the farmyard at night and even enter the kraal. Once it is in the farmyard, not only the sheep will suffer but any kind of poultry, piglets, small calves and tame animals as well. It makes short shrift, if the opportunity offers, of newly-born calves hidden by the cows.

The Black-backed jackal has an habitual method for killing sheep—the latter being startled and forced into a stampede. If necessary, the jackal will enter the kraal, having quickly learnt that the sheep will jump out hurry-scurry, and as they rush out, the jackal selects it's victim, usually the fattest sheep, and pursues this until it is brought down. An experienced sheepkiller always grabs it's victim by the throat. The grip is usually angled, one upper fang entering below the eye and the other behind the ear, while the lower fangs sever the oesophagus and the jugular veins. This grip is held tenaciously. The jackal's eyes are tightly shut and it has happened that farmers approaching from down-wind have been able to kill it while it is attacking the sheep. As mentioned previously though, the jackal is sometimes so eager to bring down it's next quarry, that it relaxes it's hold too soon, so that the sheep is choked to death by a haemorrhage under the skin.

A sheep, which is nimble enough and a strong runner, chased by a young or else a very old jackal, is first caught by the hindquarters and brought down before being slashed at the throat. Sometimes the sheep is successful in eluding the jackal after the first attack and escapes with torn hindquarters or a wrenched-out tail. Some jackals catch lambs by the snout, which they then devour up to the eyes. The lambs are frequently successful in freeing themselves, but when found, have to be destroyed. The beaks of birds, e.g. cranes have been torn out in the same way.

The bitch is generally recognised as the more active hunter, especially if there are cubs. Unfortunately, for the farmer, lambing-time coincides with the breeding season of the jackals.

Young jackals learning to kill are the greatest evil-doers, since they mutilate rather than kill. It would seem at the beginning as if they are out to practise the art of killing until it has been mastered.

Correspondents related cases of old, habitual rascals, which, if they cannot succeed in forcing the sheep to stampede, use various tricks and wiles to lure their victims. One case is reported of a jackal, trotting away, tail between the legs, but after lying down becoming aware that a number of inquisitive sheep had followed. It jumped up and began to roll on it's back until one sheep was near enough to be caught. According to Dobie (22) the Coyote also uses wily strategies to capture it's prey. For instance, it scratches a ridge in front of the mouth of the prairie dog's den so that when a storm breaks, the rainwater washes into the den, driving out the inhabitant. When hunting in couples, one Coyote will pretend to dig out the prairie dog, while the other approaches stealthily and takes up a strategic position. Presently, the one will stop digging and apparently move away reluctantly but as soon as the inquisitive prairie dog emerges from the den, the second Coyote pounces.

Black-backed jackals hunt singly, in pairs and as families as soon as the cubs are old enough to accompany their parents. It is only by exception that they run together in packs. When first taken out hunting by the parents, the young jackals merely sit and observe what must be done, and frequently prove more of a hindrance than a help. Later they assist by worrying the victim and at six months they are good hunters. A family of jackals out hunting, does not remain together but scatters, sometimes to distances of two miles. They maintain contact by frequent calls and once a kill has been made, they will be called together.

A Black-backed jackal will never kill an injured one of it's own kind but will feed on another jackal, already dead. A correspondent tells that he shot one of a litter of cubs one evening and that on the following morning, when he destroyed the rest of the litter, he found pieces of skin of the one killed first in their bellies. Murie (53) describes a case of similar behaviour in the Coyote, where the stomach contents of one were the remains of another. Cannibalism among wolves is generally recognised.

Just as they have a customary method of sheepkilling, jackals also have a characteristic manner of feeding, and from descriptions given by many correspondents it can be summed up in the following way. First the groin is torn open and the fat round the intestines and the rectum is devoured, then the jackal eats its way through to the kidneys, the fat round the kidneys and the pluck. The male then prefers the hindquarters while the bitch proceeds to feed on the fat of the chest and the meat of the forequarters. They do not feed on the belly and the entrails. Sometimes the bitches first eat out the anus to reach the rectum and they are also partial to the eyes. If a lamb has been killed the jackals devour the lactic stomach, the fat round the intestines, the kidneys and the hind-quarters; in fact very little remains of the lamb.

The Black-backed jackal's method of killing and feeding can be distinguished from that of roving dogs and the lynx immediately. The dog can easily be detected by it's larger and rounder track and by the fact that it bites where it can gain a hold so that the sheep is badly savaged and lacerated. If the dog does catch it's victim by the throat the imprints of the teeth will be found on either side of the oesophagus. The dog does not necessarily kill the sheep and frequently does not feed on it either, but if this is the case no particular method of devouring the carcase, which is dragged backwards and forwards, is followed. The Black-backed jackal also drags heavy prey to the den for the pups but then the trail lies in only one direction, viz., to the den. The lynx also catches by the throat and then sucks out the blood while it's victim chokes to death. The sheep bears many scratches and wounds made by the claws of the lynx. The latter begins by devouring the hindquarters and breast but it's work is easily recognisable by the fact that it first clears a space amongst the wool and consequently many tufts of wool are to be found in the vicinity. It never tears open the belly but is accustomed to eating away the lips and to tearing out the eyes and tongue.

It is maintained that habitual sheepkillers among the Black-backed jackals, when out on their nightly raids, usually investigate the area where the sheep have grazed during the day and follow the tracks in the hope of finding one strayed from the flock. This type of jackal is a curse to the farmer who must trek with his sheep on account of drought, as the weaklings among the flock continually lag behind.

Normally, the jackal prefers to hunt and feed by night and it will never return to the previous day's kill while there are other sheep to be caught. Unless hampered by netting wire, the jackal will go a number of miles to a neighbouring farm and if prevented from doing this by fencing, it will first search for other prey such as springhares before it returns to the carrion.

The hunt commences at dusk and continues until dawn. Some correspondents are of the opinion that it kills by preference during the hours 3 a.m. and 5 a.m. but naturally time as a factor cannot be seriously taken into account when the jackal is hungry. If the night's hunt has proved a failure, it will boldly kill during broad daylight. This is especially true of old jackals with worn teeth. During cold, bleak weather the appetite is usually sharpened and it is not uncommon for jackals to hunt by day. In misty weather they move about freely during night and day and it is generally accepted that Black-backed jackals are much more active in winter than in summer.

The Black-backed jackal is not easily checked by water, as it swims through stagnant water or swiftly flowing rivers with equal ease when in danger or if there are sheep to be caught on the opposite side. Two correspondents tell of cases where jackals tried to outwit their pursuers by lying in water with only the tips of the masks protruding. Jansen (44) relates a similar incident. A Black-backed jackal observed by another correspondent, leapt from stone to stone to cross a river.

As already mentioned, the Black-backed jackal depends on all its senses when out hunting, but according to evidence relies mostly on the sense of smell. The jackal always hunts against the wind but when trailed by dogs, it flees down-wind so that it always knows where its pursuers are and this renders the task of the dogs more difficult. Its hearing, although not as keen as its sense of smell, is well-developed and considerably better than the eye-sight. Some maintain that if conditions are favourable, it can hear sheep miles away. Its sight is certainly not poorly developed but for hunting as well as for its own safety, it relies on the olfactory and aural senses. As previously noted, it has the habit of seeking out a rise during the day in order to view all approaches, but on becoming aware of danger, it circles widely round the approaching object to determine by its sense of smell what the object may be.

Unless fenced in by netting wire, the Black-backed jackal is too cunning to have its den in the same camp as that in which it kills. Generally it transfers to another camp or even another farm. It usually raids in an area with a radius averaging from six to eight miles but it can easily traverse 30 miles or more during a night. No matter what happens, it always tries to return to its usual haunts the same night or the following morning even though it may be daylight before it comes back from the nightly raid.

Already mentioned previously is the fact, that the Black-backed jackal was originally an important scavenger but that as the depraved sheep-killer of present times, it is no longer of use in this aspect. If, however, it is denied a sheep diet, through the latter's being housed in a well-built kraal, and if it does not succeed in capturing other animals in the veld, it will resort to carrion. It has been found that it feeds on the carcasses of the following animals—horses, mules, donkeys, sheep, goats, baboons, ostriches and any kind of buck. A case of a corpse of a Native being eaten is recorded by Roberts (65). The degree of decomposition of the carcass or the fact that the remains are those left by other scavengers do not deter the jackal. FitzSimons (29) describes fights among Black-backed jackals for the possession of marrow bones, but, on the other hand, several correspondents aver that jackals do not gnaw bones, being more prone to carry these about. The bones and pieces of meat carried to the young in the den are often left lying in the veld and thus the Black-backed jackals can cause the outbreak of Botulism among farm animals.

A survey from the facts submitted by correspondents of the jackal's diet is as follows:—

> *Arthropoda.*—Beetles, circkets, ants (particulalry the large black ants which fly after rain), trek locusts, the larvae of various insects, worms and millepedes. According to Roberts (55) scorpions are never eaten.
>
> *Reptiles.*—Mabuias, agamas, tortoises, water-tortoises and according to Stevenson-Hamilton (81) pythons. Sometimes the roles are reversed and the jackal becomes the meal of the pytohn. The Coyote shares this habit of eating reptiles, Westell (84) recording a case of a water-tortoise being eaten.
>
> *Birds.*—All the types of ground birds such as guinea-fowl, partridges, pheasants, quails, larks, thick-knees, storks, lapwings, korhaans, coursers, cranes, secretary-birds, bustards and plovers. Jackals are partial to turtle-, laughing- and Namaqua-doves and to turkeys, ducks, geese, fowls (a broody hen sometimes being stolen off the nest), young ostriches and tame pigeons.
>
> *Mammals.*—Rats, mice, fieldmice, scrub-hares, red hares, spring hares, ground-squirrels, suricate-meercats, yellow-mungooses, wildcat-kittens, polecats, Aardwolves, silver- and long-eared foxes, baby porcupines, steenbuck, grysbuck, klipspringers, young springbuck, blesbuck lambs, eland calves, grey- and red-rhebuck, oribis, young baboons and the following domesticated animals—sheep, goat kids,

week-old calves, and piglets. Jackals also eat the afterbirths of cattle and sheep and are fond of the droppings of young calves. According to Roberts (65) jackals also feed on human faeces.

Vegetation.—Wild berries such as kersbush, bluebush, " rosyntjie "-bush and jackal-berries, as well as prickly-pears, watermelons, various vegetables, pineapples, groundnuts, grapes, raisins, cucumbers and green mealies are eaten. If very hungry, the jackal may pick up and eat fallen fruit such as peaches, apricots and apples but not by preference. From the list given above, it may appear that the Black-backed jackal eats much more vegetable matter than is actually the case. The same was thought of the Coyote by writers such as Jaeger (43) and Murie (53) and others, until Sperry (78) (79) produced proof to the contrary. A Black-backed jackal eats grass for the same reason as the dog does and it has been known to eat the seeds of grass and grain, but this does not mean that it can do without meat. By eating seeds, the jackal serves a useful purpose as an agent in the dispersal of seeds, for most of these pass through the alimentary canal unchanged.

After this survey of the Black-backed jackal's diet, it would seem improbable that an animal kind such as the jackal, could alter its habits of feeding to such an extent as to have changed from a very useful animal to a serious plague. It would seem far-fetched to ascribe this change to the facts that a sheep is more easily caught and is possibly more appetising and that the jackal's natural food has disappeared, for reasons already given, but at present no other solution presents itself.

The teeth of the Black-backed jackal are characteristically those of the Carnivora, but the list given above shows that today it is omniverous. In all other aspects the Black-backed jackal is so typical of its family, the *Canidae*, that it would seem as if it is only the exceptional ability to adapt itself to altered circumstances.

Shortridge (73) writes that the Black-backed jackal comes to drink at sunset or on moonlight nights, and in the sparsely populated areas it drinks at any time of the day or night.

Comparison.—In South Africa, under normal conditions, the Black-backed jackal trails the lion to feed on the remains of the lion's kill, but this type of dependence is not common to the other *Canidae*, except in cases quoted by Cahalane (14) and Dobie (22) where the Coyote formed a curious partnership for hunting with the badger.

It is only by exception that Black-backed jackals hunt together in packs but Dobie (22) and Skinner (76) describe this as a fairly common procedure among the Coyotes.

Like the Black-backed jackal the Coyote, according to Jaeger (43), Murie (53) and others, is fond of berries and veld fruit but Sperry (78) (79) has proved satisfactorily that these do not substitute for meat in the Coyote's diet.

Similar to the Black-backed jackal, water does not check the Coyote while hunting. Bryant (12) cites a case where a Coyote swam from one island to another in pursuit of water birds. Cahalane (13) believes that the Coyote likes entering the water and that in winter trout are caught through the holes in the ice. There is no record in South Africa of Black-backed jackals attempting to catch fish, but along the west coast they have been known to feed eagerly on dead fish

According to Dixon (19) and Goldman (32) there was a rapid increase in the numbers of rodents, useful birds and smaller game when certain areas in North America had been cleared of wolves, coyotes, etc. The same has been experienced in South Africa. Couch (15) to the contrary believes that the role played by the larger predatory mammals is subordinate to factors such as seasonal changes, fertility of a kind, etc.

From facts given by Cahalane (13), the Coyote is just as addicted to it's usual haunts as the Black-backed jackal and the young are also forced to give way and find their own hunting and breeding grounds.

The Red fox [Fisher (28)] and the Coyote [Cahalane (13)] have the same habit as dogs of burying food, but the Black-backed jackal leaves surplus food lying above ground, although it is frequently trapped by poisoned bait, partially buried.

VELD BURNING

With regard to the Black-backed jackal there is little to be said about the burning of veld, bush and grass. Farmers from certain areas deem veld burning a necessity while others from different districts regard it as an evil. Whatever the opinion may be as to whether the burning is beneficial or not, it is certain that countless small animals, which are the food of the Black-backed jackal under natural conditions, are destroyed even in the best controlled fires. It has been repeatedly stated that the destruction of its natural food must be considered as one of the most important reasons why the Black-backed jackal has become addicted to sheepkilling.

The lack of shelter, caused by the veld burning does not affect the Black-backed jackal in the slightest, as it prefers to hunt in the open, finding shelter for itself miles away. On the other hand, the adequacy of food and shelter stands in direct relation to the number of small veld animals in an area, for sufficient food and shelter are factors which to a great extent determine the natural increase of these animals. It is thus evident that hunger caused by the destruction of its natural veld food by veld burning has played its share in making the Black-backed jackal a sheepkiller.

Farmers from areas where annual veld burning is regarded as an absolute necessity, maintain that there is no marked increase or decrease in losses due to jackals whether the veld is burnt or not. It is important to note, however, that there is evidence that the Black-backed jackal has not always killed sheep in these areas but has only acquired the habit in recent years.

Correspondents from the highveld of Transvaal, state that the Black-backed jackal has penetrated into this area, following on general destruction of game in Zululand, as well as from the bordering Native territories and the lowveld. It is obvious that the jackal will be ousted as more and more farms in the lowveld are developed chiefly for the cultivation of vegetables and for breeding cattle. The jackals flee from the Native territories in self-defence. It therefore follows naturally that as the farmers of the highveld have rid this area of the jackals' natural enemies—the cheetahs and leopards, they will migrate to these parts. Deprived of their natural food by the veld burning, these jackals then become sheepkillers. Of interest is the fact that not only the Black-backed jackal but the Side-striped jackal as well has migrated to these parts and unfortunately the latter has also quickly acquired the habit of sheepkilling.

Veld burning does not help in the destruction of the jackal for if necessary, it seeks shelter elsewhere. Those which cannot escape the fire in time find cover in burrows and rock fissures and at most only the sick and crippled jackals are destroyed. In contrast to this, veld burning is a serious disadvantage when the jackal is hunted by dogs for the strong odour of the burnt vegetation spoils the dogs' sense of smell and the burnt stubbles injure their paws.

MATING AND REPRODUCTION

It is maintained that the jackal cubs when weaned, have already chosen their future mates from the same litter to which they belong. Under natural circumstances, therefore, there is inbreeding to a fairly large extent. It appears that young males and bitches of nine to ten months have already chosen their mates and that the selection of mates takes place during March, April and May or at any rate a considerable time before the mating season begins. Once a mate has been chosen the pair remains together.

During May, June and July the bitches usually become ruttish, but in exceptional cases this may occur as early as April or as late as August. According to some correspondents, the period of being ruttish is like that of dogs, viz., nine days but others believe it to be seven days and that of a tame jackal bitch has been noted as seven days. In many cases mating takes place on the third or fourth day but apparently it is more usual on the sixth or seventh day.

When a bitch on heat already has a mate, she is quiet and the male usually follows her example in order not to attract others, but if the bitch is still seeking a mate she will make this known in characteristic manner. Roberts (64) describes the cry as a shrill, hearty laugh. An abrupt " ha-ha-ha " precedes the usual call of " nieaaa-nieaaa " and is more aptly described as a laugh than a cry. One correspondent compares the call to the neighing of a young mule. The howl of the male following the bitch is almost similar to hers, only deeper.

In cases like these a ruttish bitch speedily has a following of up to six males. She frequently urinates during this period and the following males, visiting the same places, kick dust over these with their hindlegs. The males trailing such a bitch usually fight fiercely among one another, the best fighter winning the bitch. Naturally not only the lone bitches attract a following, as the secondary sexual glands of each emit a strong smelling substance of which the males become aware from afar. One correspondent compares this to the scent of the polecat. If the bitch already has a mate, she will remain faithful to him and though she does not take part in the resultant fight between him and the victor of the following males, she will help to lick her chosen mate's wounds.

During the mating season the dog and the bitch frequently play together and he usually rolls about in front of her before mating. It is also maintained that the male digs a hole during the mating season in which to urinate and defaecate and that this is carefully filled up again by the use of the front paws.

The vulva of a jackal bitch becomes swollen just like that of a dog bitch and towards the end of the period there is also some bleeding. During this time she is less timid, even towards humans, and she does not attempt to flee from dogs, rather trying to lure the male dogs to mate with her by circling, then lying on her back and inviting them to play. The male dogs will not harm her but if there are dog bitches in the pack they will readily attack her.

Some correspondents are of the opinion that the sexual organs of the male and female jackals do not tend to become interlocked during the sexual act, as is the case of dogs, because there are never two sets of tracks and because the jackal's penis differs from that of the dog, but the majority of correspondents state that interlocking of sexual organs does take place for jackals have been found like this and destroyed. It has been told that up to six other males have been observed watching the mating process.

After mating, the male and the bitch are lifetime mates although they separate temporarily when the cubs have been raised, i.e. when these are six months old, but the parents remain in the same neighbourhood and come together at the next mating season. If the male is killed during the time of separation, the bitch waits until the following mating season before luring another mate. Similarly, if the bitch perishes in the interim, the male waits until the next mating season before finding another bitch. The Black-backed jackal male is monogamous and is not lured away by other bitches.

It occurs frequently that one of a pair is killed during the mating season. If the male has been killed the bitch will lure another mate unless she is in pup; this being the case she will whelp and care for the cubs alone. If the bitch has been destroyed, the male searches for a new mate, usually in another neighbourhood, unless there are cubs for which to provide. He cares for them and carries food to the den but if they still have to be suckled, they die.

The gestation period of a Black-backed bitch is from 60 to 65 days according to correspondents. Roberts (65) (66) states the same. Kenneth (45) records that this is from 57 to 70 days in the case of the Side-striped jackal.

The number of cubs in a litter depends on the age of the bitch. The first litter of a young bitch or that of a very old bitch is generally small, from one to three, but the litters of mature bitches vary from four to ten. The average litter numbers from five to seven.

It sometimes happens that a bitch in pup, which has been pursued for miles by hunters and dogs or has been badly savaged by dogs, will abort. One correspondent tells of a case where a bitch and her cubs were cornered in a burrow and that when they were dug out it was found that the bitch had bitten all the cubs to death. The only explanation to be offered for this is the fear and panic of the mother.

A mature bitch is able to produce two litters in one season. One case has been reported of a bitch with three unweaned cubs being killed and found to be pregnant with three more. Another case cited is that of a bitch, accompanied by three and found to be in pup with five more.

The breeding season varies in different parts of the country, but the difference is slight, being from a month earlier or later. The birth of litters is most generally reported during October but newly-born pups can be expected from July to November. In the records given by correspondents, the earliest litters are dated in April and the latest in February, but the litters born before July and after November must be regarded as out of season. These are usually the first litters of very young bitches or the second litters of the season of mature bitches.

A young bitch of nine months may become ruttish and mate, but generally, the first mating appears to take place at 12 to 14 months and thus the litter is produced late in the breeding season.

The young are born in earths, usually those deserted by antbears, which the jackal parents have occupied, enlarged and cleaned out. If nothing better offers a hollowed-out antheap or rock fissure is used, but if even these cannot be found the bitch whelps under any suitable shelter, or either digs a burrow herself or scrapes out the ground from underneath a flat stone. The search for a suitable birth-den begins after mating.

The bitch spends the first two or three days in the den with the cubs and it seems as if, like the dog bitch, she pays little heed to anything outside the den. During the following eight to ten days she remains with the cubs in the den during the day to suckle and care for them, but at night she goes out hunting with the male. After the tenth day the cubs are left alone during the day as well, the bitch entering the burrow only to feed them but both she and the male remain in the immediate vicinity of the burrow during the day. The male never remains in the burrow and at most will enter it during the first few days when bringing food for the bitch. Every evening, usually just before sunset, the bitch suckles her young before leaving to hunt. She always approaches the den against the wind. The bitch has eight mammae and usually only six are in milk, though it depends on the size of her litter.

At 14 days the cubs begin to play outside the den and at two to three months are able to accompany their parents when hunting. When they are six to eight months old they are able to care for themselves and leave their parents.

It is very difficult to determine whether the cry of the jackal parents betrays the presence of newly-born cubs. Various correspondents are very definite that the parents do not call during this time, but others are positive that this is the case. As already mentioned, Roberts (64) states that if jackals are heard calling in the same neighbourhood on consecutive nights, it is certain that there is a burrow with cubs. The call is staccato and more plaintive than customarily. It is maintained that the male and bitch " sing " while hunting for food for their young and that they call to each other when food has been found.

Comparison.—According to Sheldon (72) the Red fox and the Gray fox are also monogamous and Beckman (6) records the same of the European fox. Seton (71) states that the Coyote is monogamous but Sheldon (72) queries this as two Coyote bitches, each with her own litter, are frequently found in the same den. Cahalane (13) cites incidents where aged bitches help younger ones with the rearing of their cubs.

Where it is exceptional for the Black-backed jackal bitch to breed twice during one season, it is the general rule in the case of the Red fox, according to Asdell (2).

Similarly to the Black-backed jackal, the vulva of the Red fox [Asdell (2)] and of the Silver fox [Basset and Leckley (5)] becomes swollen when the bitch is on heat.

It may happen that Black-backed jackal bitches do not breed during the first year and Taylor (83) describes a similar condition in Gray fox bitches held in captivity.

Grinnell (35) records the gestation period of the Gray fox as 63 days which approximates that of the Black-backed jackal bitch which is held to be between 60 and 65 days.

Schoonmaker (68) reports that Gray fox males fight each other while the bitch watches unconcerned. The same has been observed of the Black-backed jackal.

During mating time the cry of the Black-backed jackals is heard throughout the night and according to Schoonmaker (68) the same is true of the Red fox.

REARING

When the Black-backed jackal cubs are born their eyes, like those of dog puppies, are still closed and only open on the eighth day. They are comparatively helpless and their mother is obliged to spend the first three days with them in the den. At this stage the bitch herself takes little interest in anything besides her cubs. After the tenth day, she leaves them at night to hunt but remains with them during the day. While she is still constantly in the den the male supplies her with food.

The young suckle almost immediately and for the following fourteen days to three weeks their only nourishment is milk, but after this they feed on masticated and partially digested meat disgorged for them by the bitch. The Black-backed jackal bitch, as already mentioned, has eight mammae, which all come into milk although it frequently occurs that only six remain in milk. Sometimes more of the mammae become dry so that there is one only for each of the cubs. At first the cubs suckle a few times per day and also at night, but as they become stronger and if additional food is given, the bitch allows them to suckle only in the evening, at dusk and at dawn.

Pieces of meat from hares, rock-rabbits, lambs, birds, etc., are brought to the cubs when they are three weeks old, though in some cases this may occur earlier or later. Both parents help to bring the food to the cubs and this substitutes for the second stage of the feeding when the bitch disgorged partially digested food for the cubs. While the bitch still provides for the cubs by disgorging food, she is naturally famished and is frequently caught at this time by poisoned bait placed near the den. If she tries to rid herself of the poison by vomiting and the cubs feed on the vomit, it may prove fatal to them. The bitch will probably also die as the poison will act most effectively on her empty belly. If she is not affected to too great an extent by the poison, she will ward off the cubs, even by biting and growling. If the bitch picks up poison some distance from the den and dies, the male rears the cubs unless they still have to be nursed in which case they will die.

The pups are weaned when they are eight to ten weeks old and their food then consists of pieces of meat brought to the den by their parents. Sometimes at this age they already accompany the adults on the hunt.

When they are 14 days to a month old, depending on the circumstances, the cubs are allowed to play outside the den and are also fed there with the result that there is an accumulation of pieces of skin, hair, bones, feathers, putrefying entrails and dung. This attracts blue-bottles and midges and it it difficult to determine whether the jackal parents are too lazy or too stupid or too audacious to clean the surroundings of the den. On the other hand, these objects which so easily betray the presence of cubs are actually the playthings of the cubs. The latter also soon wear a path to the nearest antheap or bush as they run backwards and forwards while everywhere round the entrance of the burrow there are tracks, hair and places where they have rolled, micturated and defaecated, which will indicate whether the den is inhabited. If danger threatens the mother emits a characteristic "wuf" which makes the cubs seek refuge in the den.

The male and bitch remain in the vicinity of the burrow during the day, usually about two to three hundred yards away from the entrance of the den and in a situation where they are down-wind and have a view of the den. They do not stay together and the male does not go to the den.

If the bitch has to nurse her cubs, she approaches against the wind and on emerging again, intently views the surroundings before trotting away rapidly without a backward look. After she has covered 30 to 40 yards, she slackens her speed and returns more slowly to her post.

When dogs approach the birth-den, the jackal parents move off to a considerable distance, probably to divert the dogs, but if they themselves are discovered first by the dogs, they run away without looking in the direction of the den. If the jackal parents are sure that the presence of cubs in the den has been discovered, they carry the cubs to another burrow by the scruffs of the necks like kittens.

The cubs abandon the burrow when they are about two to three months old and shelter with their parents in the open veld. The young jackals lie together in pairs in the veld and thus when the time comes for them to leave their parents, the pairs of brothers and sisters remain together and eventually mate unless one is killed.

When the cubs are old enough to leave the den they are usually old enough, too, to hunt with the adults. As already described, at first their assistance is slight and they are probably more of a hindrance than a help to their parents. At first they are taken only a few hundred yards from the burrow and kept together by frequent calls. If one strays from the others it is quickly tracked by the parents. By observing their parents the young jackals soon learn to hunt, but judging from experiences with young, tame jackals which have escaped, it seems as if hunger is the best teacher and that it is instinctive in the jackal to catch its prey. It is only necessary to master the art of hunting by practice.

At the age of three months the dull, over-all lead colour has already been replaced by the characteristic black and white saddle on the back and the rufous of the flanks, the lumbar regions and the legs. The cubs develop rapidly and at six months are practically mature. At this stage they are very destructive and are largely responsible for the killing of more lambs than needed for food. It seems as if they kill unnecessarily to gain as much practice as possible.

At six months the stage has been reached when the young must fend for themselves. Sometimes there are cubs slow in leaving their mother so that she is obliged to rid herself of them by leading them to another area and then disappearing stealthily. One correspondent relates that he killed a bitch and the accompanying six young jackals in a fenced-in area. On examining the bitch, he found that she was in milk and by following the tracks, he found a burrow containing six other small cubs. Apparently, when the young of her first litter would not leave her, the bitch had forced an opening under the netting-wire and led the young jackals through with the intention of abandoning them there.

If the young jackals are still with her when the next mating season begins and she becomes ruttish, she generally chases them away by growling and biting. Sometimes, though she has driven them off, they still follow her at a distance and also feed on the remains of the kills left by her and her mate.

Comparison.—According to Sheldon (72) both the Red fox and the Gray fox bitches have eight mammae but in the case of the Gray fox, similar to the Black-backed jackal bitch, two of these become dry so that only six function.

Schoonmaker (68) records that the North American Red fox males and bitches help each other in the rearing of the young and the same is true of the Black-backed jackals, but according to Beckmann (6) the male of the European fox does not assist the bitch.

Like the Black-backed jackal cubs, the young of the Red fox are very playful and the warning growl of the bitch is frequently ignored. [Westell (84)].

According to Cahalane (13) the young of Coyotes, like the Black-backed jackal cubs, are gradually weaned when partially digested food regurgitated by the mother, becomes part of their diet.

Like the Black-backed jackal, the Coyote parents also carry away their young when the den has been discovered. [Eadie (25).] Eadie (25) found that many of the objects, lying about in front of the den, were removed by the young on their own or together with their parents, and this has raised the question whether these pieces of birds, bones, etc., which serve as the cubs' playthings, are not also used in the process of teaching. The habit of carrying the young to safety is also common to the Red fox and the Gray fox [Schoonmaker (68)] and the European fox [Muller (52).]

Cahalane (13) describes how the young Coyotes accompany the parents and are taught to hunt and the same procedure is followed by the Black-backed jackals. Schoonmaker (68) while giving the same facts about the Red and Gray foxes, points out that a young Gray fox which escaped from captivity, was well able to fend for itself.

A young Red Fox, according to Sheldon (72), is weaned at the age of two months and this is identical in the case of the Black-backed jackal.

Westell (84) relates that the Red and Gray fox families remain together until Autumn before dispersing, but that it is difficult to determine exactly when the male leaves his family. Again this is like the Black-backed jackal for the young leave their parents at six to eight months, i.e. in the Autumn and it is also uncertain when the male leaves his family only to return to the bitch at the following mating season.

BURROWS

The Black-backed jackal makes use of a burrow only during the breeding season. In exceptional cases, if the pursuing hounds and hunters are too near, it will seek refuge in a burrow, but unless it is dug out of this, it will emerge in about half an hour, especially if it believes that the danger is past. Sometimes it has been found that a jackal, having gorged itself, lies and sleeps in a burrow or a hollowed-out antheap, but this is not often the case. An injured jackal may also seek refuge in a burrow, but this is chosen at random and is not its regular home.

As already mentioned, the Black-backed jackal is very addicted to its usual haunts and will leave the area only if too vigorously persecuted. The chosen territory will be as open as possible for although the jackal sometimes shelters in undergrowth, it does so where the undergrowth is sparse. In the bushveld of the Transvaal and other densely vegetated regions the jackal prefers farms where large areas have already been cleared. An explanation for this preference of the jackal may lie in the fact that the small veld animals on which it normally feeds do not frequent very dense undergrowth and that in earlier times its arch-enemy, the leopard, made the bush untenable for it.

It is a well-known fact and one already stated, that when Black-backed jackals migrate to a farm which was previously frequented by other Black-backed jackals, since destroyed, the newcomers do not only select the same range as their predecessors but also make use of the same breeding dens. Very frequently these dens are found in the most unexpected places and on analysing the reasons for this, two factors emerge as the most important, viz., sufficient food and adequate shelter. A possible third factor is the absence of natural enemies. Thus it is impossible to give a description of a typical site, for the nature and circumstances vary so much throughout South Africa that it would be necessary to describe typical examples from every region. Perhaps one generalization can be made, viz., that the Black-backed jackals prefer the plains and hills to mountainous regions and that they seldom frequent mountain ravines. The sheep farmer of the highveld of the Transvaal will probably not agree with this contention.

According to correspondents, it is only in the North West of the Cape Province, districts in the Eastern Province and by exception in certain areas of the Karroo, that the Black-backed jackal digs its breeding earth itself. Usually these jackals are content to move into and put into order the abandoned burrows of other animals. They make use of antbear, springhare, and even meercat burrows. The jackals do not force the original owners to vacate the burrow but sometimes they move in and the other animals then prefer to move. Black-backed jackals favour antbear earths even though inhabited by porcupines. Frequently the jackal finds it useful to have a porcupine as a fellow occupant of the burrow because it shelters behind the porcupine in the den, if pursued by dogs. Often the jackal is hurt by the porcupine's quills but then on the other hand the latter's young frequently serve as food.

If a suitable burrow cannot be found, the Black-backed jackal avails itself of hollowed-out antheaps, rock fissures or cavities under stones. Cases have been known where bitches have simply whelped under the most suitable bush.

The Black-backed jackal is a poor burrower and it is usually only the bitch which burrows although the male has been known to help her. Occasionally the bitch digs a few burrows before deciding on one and she usually begins digging about a fortnight before she must whelp, i.e. towards the end of July to the middle of August or even later. The entrance of the burrow is small, about six inches in diameter and there is only the one opening. The burrow is shallow and measures from three to six feet from the entrance to the back wall, but is roomy enough inside for the bitch and her litter. These burrows are dug preferably in sandy or red loamy soils.

It seems most probable that the bitch chooses the area as she remains there if the male is killed, while in cases where the bitch is killed, the male migrates, only waiting to rear the young if there are any.

There is no hard and fast rule for where the burrows are to be found and these have been found in the most improbable places such as next to busy public roads or in the midst of dense undergrowth. Usually, however, there is a certain extent of cover round the entrance of the den. A few bushes or loose stones in front of the entrance of the burrow, which will provide the cubs with some shelter, e.g., against hawks, are preferred, but fully exposed burrows are also commonly used, especially if the use of these excludes the necessity of the jackal's digging one itself. The Black-backed jackals favour dens among loose rocks, in high grass, among scattered shrubs, under flat stones and in rock fissures. In mountainous regions the dens are generally to be found on the ridges and slopes while on the plains areas where the vegetation is not too dense are selected.

Unless food is exceptionally plentiful in an area the breeding dens are never situated closer to one another than necessary. The priority of the first comers is acknowledged by the jackals and they do not intrude on one another's hunting grounds. If there is the danger of over-population, some of the jackals migrate, with the result that jackals are never numerous in a limited area unless there is artificial interference such as netting wire. For the same reason two families of Black-backed jackals are never found in the same burrow.

If a pair of Black-backed jackals is not disturbed or expelled, they will make use of the same breeding den annually and will only abandon this if it has been discovered or become flea-infested or malodorous.

On discovery of the den by enemies, the young are carried to safety by the parents. According to various correspondents, this second shelter is of long-standing choice, so that it would not be necessary to search for refuge in haste. Often the second burrow is only a few hundred yards away but it may be as far as two miles from the original birth-den. If the cubs, discovered in the burrow, are old enough, they will shelter with their parents in the veld, even though this is earlier than their custom. The cubs will be evacuated within an hour of the parents having become aware that the den has been detected. During the day the parents are usually close enough to the earth to become instantly aware of danger.

If the burrow is of such a nature that the cubs cannot be dug out or fetched out by dogs, the fact that humans have lingered round the den is sufficient reason for the jackals to move. On a return visit the following morning, the tracks may be traced to the new earth, which may be more accessible, and the cubs destroyed.

That the Black-backed jackal parents are fearless in defence of their young is shown in an incident related by a correspondent. Having found an earth with young late one evening, he left his dog tied to the entrance of the den to prevent their flight. Returning to the site early the following morning he found that his dog had been killed and the cubs removed by the adult jackals. As already mentioned, if dogs approach the den's vicinity, the parents show themselves thereby trying to save the cubs by diverting attention to themselves. Disastrous for them is their habit of returning directly to the earth once they believe they have shaken off their pursuers for thus anybody having remained in the vicinity is easily able to find the den.

If the Black-backed jackals are found occupying an antbear-earth, it is no easy task to dig them out and it is desirable that trained dogs should be used to fetch them out. These antbear-earths always have more than one opening and the tunnels may extend to 45 feet in length and to 10 feet below the surface of the ground. There are numerous cross passages and usually more than one floor. The jackal naturally uses only one of the passages for a breeding den, but the cubs investigate all the tunnels and thus know of the most suitable refuge when danger threatens.

As previously stated, it can easily be detected whether the den is inhabited or not by the accumulation of rubbish round the opening, but the dust-trodden entrance and the worn paths to this also betray their occupancy. Fleas and an abundance of hair are usually also to be found in the entrance.

That the earth is unoccupied, may be judged by the spiderwebs over the entrance and the absence of the above mentioned.

When the breeding-season has passed, meercats and even lynxes will take over the deserted dens and if porcupines have been fellow-occupants with the jackals, they will remain after the jackals have moved out.

When the young jackals are strong enough, i.e. at the age of two to three months, they find shelter with their parents in the veld and as mentioned previously, they do not all shelter together for the cubs lie together in pairs. The Black-backed jackal does not lie in exactly the same place every day but unless disturbed, remains in more or less the same area. In winter the jackal prefers a sunny place and even changes position as the sun moves while in summer shady spots are selected and in excessive mid-day heat the jackal goes to drink. In summer, also, the jackal sets out on its hunt earlier in the evenings probably as the period of darkness is so much shorter than in winter.

The sheepkiller among the Black-backed jackals is careful not to kill in the immediate vicinity of its den, and it is even maintained that it will pass through a flock of sheep to avoid this. Naturally everything is dependent upon the sufficiency of the natural food in the immediate surroundings, as it does not hesitate to kill these animals near the den. The jackal's usual, average radius of its hunting area may be assumed to be up to seven miles from the den but if necessitated by circumstances, it will cover 30 miles or more during the night.

It is unfortunate that the human activities of farming have to a certain extent created unnatural circumstances, so that today it is almost impossible in South Africa to determine the natural relation of the Black-backed jackal to its surroundings, but it may be repeated correctly that the Black-backed jackal is not much disposed to abandon its usual haunts without good reason. It is inherently territory conscious and this is acknowledged by its own kind. It will only abandon its home area under pressure.

In the natural state the jackal's enemies—leopards, cheetahs, birds of prey, perhaps pythons and diseases, limited its normal increase, but in the conditions created by man this increase can only be restrained by artificial methods.

Comparison.—In contrast to the European fox, as recorded by Sheldon ([72]), where the male alone is responsible for the preparation of the breeding den, the opposite is true of the Black-backed jackal and in this, according to Schoonmaker ([68]) it is more in accordance with the Red fox.

The males of most of the *Canidae* carry food to the bitch, after she has whelped, and the majority, among others the Black-backed jackal male, assist in the rearing of the young, but Beckman ([6]) records that the European fox bitch does this work alone.

As stated by Dobie ([22]) the Coyote is as lazy as the Black-backed jackal to dig a burrow for itself and the bitch will also make use of any, suitable, existing earth.

Eadie ([25]) describes the same accumulation of the remains of meals round the den of the Coyote, as is to be found round that of the Black-backed jackal. It is interesting to note that when danger threatens and the cubs are carried to another den, some of the apparently discarded objects are taken along.

The Black-backed jackal prefers the open veld under normal circumstances, but according to Yeager ([88]) and " C.P." ([16]) the Gray fox frequently makes its home in a tree. There are no records of a tree-climbing Black-backed jackal although a case has been cited of one leaping from a ledge onto a heron's nest in a tree and Jansen ([44]) also gives an account of one leaping into a low bush.

It is important to note, at this stage, that the Aardwolf in contrast to the Black-backed jackal, shelters in burrows during the day. The former's sharply pointed tracks are easily recognisable as opposed to the more rounded prints of the Black-backed jackal. The Aardwolf also has the habit of partially closing the entrance of the den, after entering, so that the heap of fresh ground in the opening of the burrow is sufficient evidence to the farmer that the den is not occupied by a Black-backed jackal.

NATURAL ENEMIES, DISEASES AND PARASITES

In nature, Black-backed jackals have several enemies which curb their numbers, but the most important of these and greatly feared by the jackals, are the leopards and cheetahs.

According to Stevenson-Hamilton ([81]), as well as on the authority of various correspondents, the python is an important enemy, which is annually responsible for the destruction of a good number of Black-backed jackals. As the Black-backed jackal customarily keeps to footpaths, it is frequently ambushed by the python lying in wait for its prey.

The wild dog (*Lycaon pictus venaticus*) and the Black-backed jackal do not live together in amity and it is remarkable that in the areas frequented by the wild dog, few if any Black-backed jackals are to be found.

Various correspondents list the baboon as an enemy of the Black-backed jackal. The latter are known to kill the young of baboons and it is comprehensible that they will come into conflict with the adult baboons and certainly be worsted.

The larger birds of prey annually account for numbers of Black-backed jackal cubs, rashly lying asleep or playing outside the den.

It is very evident from the above mentioned, that the usual natural enemies of the Black-backed jackal are also those which come into conflict with the activities of human beings, with the result that their destruction gives the Black-backed jackal a measure of undeserved protection to which it is certainly not entitled. Thus, the problem confronted once more is that of artificially created circumstances caused by the advent of man. Under natural conditions the Black-backed jackal performs its useful functions, and its destruction invokes new problems.

Sick Black-backed jackals are seldom found in the veld. Sometimes one is come across in an emaciated state and it can only be assumed that it possibly picked up poison, but rid itself of this to such an extent, that it survived though still suffering from the after effects.

A Black-backed jackal so hampered by partial paralysis that it could be overtaken and destroyed, was found on examination to be harbouring the tick (presumably *Ixodes rubicundus* Koch), which causes paralysis in sheep. This evidence is supported by other correspondents from their own experiences.

Sometimes Black-backed jackals kill sick sheep which have eaten "krimpsiekbos" or feed on the carcasses of sheep which have succumbed to " krimpsiekbos " poisoning and then develop the same symptoms and eventually die. According to Prof. Dr. D. G. Steyn of the Department of

Pharmacology of the University of Pretoria, this is quite possible as dogs which have fed on the carcasses of such sheep, have developed the same symptoms of the disease and died as a result.

Dr. W. O. Neitz of the Department Protozoology and Virus Diseases, Onderstepoort, lists the following diseases as prevalent among Black-backed jackals in his summary " Diseases Occurring in Wild Animals in South Africa " (unpublished):—

Virus Infection: Rabies; Distemper.
Protozoal Infection: Biliary Fever—*Babesia canis*; Nagana—*Trypanosoma congolense*; Anaemia—*Hepatozoon canis.*
Rickettsia Infection: Rickettsiosis—*Rickettsia canis.*
Unclassified: Toxoplasmosis—*Toxoplasma gondii* (=*T. canis*).

Regarding Rickettsiosis, Neitz and Thomas ([56]) and Bigalke ([9]) write that the wild dog of the lowveld is subject to the same disease or one similar, but it seems as if this is not prevalent among Black-backed jackals frequenting the same area, at any rate not to such an extent that their numbers are considerably affected.

It is also possible to infect the Black-backed jackal with diseases by artificial means, as proved by Neitz and Steyn ([55]), provided the proper vectors are available. These experiments, however, were carried out under laboratory conditions, and the question still remains whether it would be possible to spread a disease which would attack and kill in the veld only the Black-backed jackal. Not one of the above-mentioned diseases is common only to the Black-backed jackal and to liberate these would endanger useful jackals as well as dogs. In Australia the virus disease *myxomatosis* was spread among the rabbit population by means of mosquitoes and it seems as if this will be a successful method of control. Unfortunately, with the decrease in the number of rabbits, the dingo is once more finding its food among the sheep flocks ([62]).

Ecto-parasites.—According to Dr. G. Theiler of the Department of Parasitology, Onderstepoort, three types of fleas have been identified on the Black-backed jackal, viz.:—

Echidnophaga gallinacea Westw.,
Synosternus caffer Jord. & Rothsch., and
Ctenocephalides cornatus Jord.

Of these only the former two are acknowledged plague vectors for there is no existing record that the same is true of the third type.

The following ticks have been found on the Black-backed jackals:—

Rhipicephalus sanguineus Latreile—carrier of Biliary fever and Rickettsiosis.

Hyelomma spp. (Bontpoot)—Bites cause great inconvenience, and sometimes partial lameness.

Ixodes rubicundus Koch (Red tick)—Causing paralysis in sheep.
Boophilus decoloratus (Blue tick).

According to Dr. G. Theiler it is very probable that *Haemophysalis leachi*, carrier of Biliary fever in dogs, as well as tick fever in humans, is also to be found on Black-backed jackals.

There is only one record of the presence of lice on Black-backed jackals, viz., that of Roberts ([64]) and he only mentions the fact.

Black-backed jackals are further subject to the bite of the Tsetse-fly (*Glossina* spp.), the carrier of nagana.

Endo-Parasites.—According to Dr. R. J. Ortlepp of the Department of Parasitology, Onderstepoort, it is expected that all the *Cestodes* and *Nematodes*, which occur in South African dogs, viz.:—

Cestodes: *Dipylidium caninum, Taenia hydatigena, Taenia pisiformes, Taenia ovis, Taenia multiceps, Taenia serialis, Echinococcus granulosus;*

Nematodes: Toxascaris leonina, Toxacara canis, Ancylostoma caninum, Ancylostoma braziliense, Filaroides osleri, Spirocerca lupi, Physaloptera canis;

may also be present in Black-backed jackals. He (58) has, however, already reported three *cestodes* from this jackal, viz.: *Taenia jakkalsi, Taenia multiceps, Taenia serialis.* A fourth, *Taenia pungutchii*, from an unknown source, presumably also a Black-backed jackal, has also been described by Dr. Ortlepp.

In a personal communication Dr. Ortlepp mentions the following endo-parasites which have also been identified in the Black-backed jackal:—

Cestodes: Dipylidium caninum, Taenia erythraea, Echinococcus granulosus.

Nematodes: Toxascaris leonina, Ancylostoma caninum, Ancylostoma braziliense, Ancylostoma martinaglia, Physaloptera praeputialis.

Baer (4) also reports the presence of *Dipylidium caninum* and *Taenia erythraea* in the Black-backed jackal.

On account of its scavenging habits and the fact that it leaves old bones and pieces of rotting meat lying about, the Black-backed jackal plays a minor but very dangerous role in the spreading of stock-diseases. As stated by Henning (10), stock which eat food and drink water which have been in contact with contaminated material, will develop such diseases as Anthrax, Blackquarter and Botulism. Besides this, cattle have the habit of picking up bones or eating pieces of the rotting meat if there is a lack of certain elements in their diet.

Comparison.—According to Eads (26), the Coyote also has its fleas, ticks and lice, the fleas being plague-carriers as well, liable to affect humans.

Cahalane (13) names the natural enemies of the Coyote as the Cougar, the Golden Eagle and famine and mentions the possibility of deer killing Coyotes by trampling them.

With regard to the other South African jackals, they are probably all prone to the same diseases and parasites as the Black-backed jackal. According to Neitz (unpublished) rabies has been diagnosed in the Aardwolf, nagana in the Long-eared fox and rabies and distemper in the Silver jackal. Two endo-parasites in the Long-eared fox, and one in the case of the Silver jackal have been described.

The natural enemies are the same as those of the Black-backed jackal, only the latter itself must be added to the list, for especially the Long-eared and Silver foxes find life difficult in the same areas as the Black-backed jackals.

CROSS-BREEDING

It can be stated unconditionally that Black-backed jackals under natural conditions in the veld, will not hybridize with other related animals, but this commonly happens in captivity. From the various facts given by correspondents, it is interesting to note that only one case is mentioned of a dog bitch mating with a jackal male. The facts given, though few, are as follows:—

(1) Irish Terrier bitch × Black-backed jackal male; offspring excellent hunting dogs.

(2) Alsatian male × Black-backed jackal bitch; three pups.

(3) Two cases of male dogs mating with Black-backed jackal bitches, but of which no further information could be given.

A very interesting crossing of breeds, that of a Collie dog and a Silver fox bitch, is reported by a correspondent. The bitch gave birth to one pup, a female, which later mated with a male dog and had a litter of six. Unfortunately, these pups were covered with mange and had to be destroyed.

The jackal hunter knows that a male dog will not attack a ruttish jackal bitch and it has already been described how she will attempt to induce the male dog to mate with her.

Until more facts have been made available by controlled experiments, it can only be stated that cross-breeding is possible. FitzSimons (29) has already recorded that they mate freely.

Comparison.—Dice (18) found that a Coyote bitch × a male dog produced a litter, but that although Coyote males and dog bitches mated freely, no young were produced.

According to Sjöstedt (75), Przibram (60) and Noack (57) it is common for wolves and dogs in Europe to cross breed, the hybrids being fertile.

Bezdek (8) found that the Red and Gray foxes of America crossed with each other but that the offspring were not fertile.

Experiments in cross-breeding, however, are only interesting to the research worker although the idea has been mooted that such a hybrid may play a useful role in the campaign of extermination of the Black-backed jackal.

TAME BLACK-BACKED JACKALS

From the study of records of tame Black-backed jackals, it may be seen that no matter how young the captured jackal may have been, its cunning is innate. One correspondent relates that he removed six unborn cubs from a bitch which he had killed. They were still alive and he fed them on cows' milk, by means of a dummy, and let them suckle a dog bitch, which he had to hold down by force. When they were three weeks old he fed them on porridge and raw meat. At six weeks, the cubs disappeared one night and were later discovered in nearby meercat burrows. After this they returned to the farmyard every evening for food but at seven weeks they killed a fowl and afterwards entered the kraal and killed and fed on a few goat kids, while leaving others badly savaged.

This evidence, together with that of many other correspondents, indicates that the Black-backed jackal will always, in spite of the best treatment, retain its wiles. It is even thought that a tame Black-backed jackal is more cunning and perhaps bolder than one from the veld, as it seems to know that the dogs of the farmyard will do it no harm. Dogs will not easily attack a jackal reared with them in the same farmyard and will be induced only with difficulty to attack one raised in another farmyard. It is difficult to determine whether this is due to the jackal's domesticated manners only or whether a certain extent of human smell clings to the jackal.

It has occurred that a tame jackal which has escaped, has returned to its captor. One such case was quoted in *The Wool Grower* (61) and FitzSimons (29) mentions the same habit. Gradually, however, the tame jackals become more and more estranged until eventually they return to the wild state altogether.

Drake-Brockman (23) tells of a tame Black-backed jackal and a Native's dog, which formed a partnership for hunting, but eventually not only the jackal but the dog as well became altogether wild.

According to the ages and months given in their evidence by correspondents, it seems as if tame jackals usually become wild again just before the mating season, i.e. generally in March. If, however, there are other wild jackals in the neighbourhood, the urge to escape will be strong whether or not it is mating season.

Adult Black-backed jackals can never be tamed as they die—presumably from fear—within 24 hours of their capture. Experiences have shown that if wild, Black-backed jackals are startled while trying to evade their pursuers, they are so confused as to be powerless for a few moments. It is therefore no exaggeration to ascribe fear as the cause of death.

Cannibalism among Black-backed jackals is known to occur sometimes under natural conditions, but it is fairly common that cubs born in captivity are devoured by their parents and that young jackals placed in the same run as larger jackals, are killed and eaten by the latter. Schneider (67) describes the case of a bitch in the Leipzig Zoo which ate her day-old cub. According to the same writer, the average number of cubs per litter, born in captivity, is generally four and thus the average is smaller than for those litters produced under normal conditions.

Schneider (67) also records that a bitch held in captivity becomes ruttish only once a year and that the sex cycle is so regular under artificial circumstances, that two consecutive litters, spaced by exactly one year, were born on the same date.

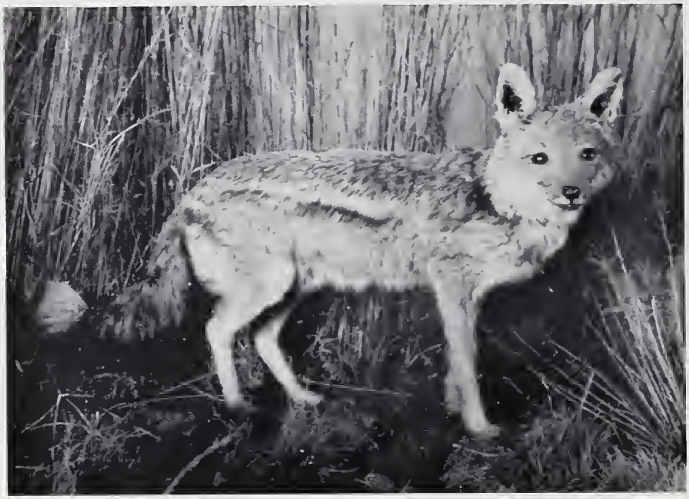
Unfortunately, there are no published records of the period of gestation of the Black-backed jackal bitch in captivity, but Haacke and Kuhnert, as well as Brehms [quoted from Schneider (67)] give the gestation period of *Thos aureus L.* as 63 days and Heinroth [also quoted from Schneider (67)] states the same number for the North-African jackal (*Thos anthus* Cuv.). These correspond with the approximate figures of 60 to 65 days, accepted as the gestation period of the Black-backed jackal under natural conditions.

CHAPTER 2

Other Jackals

THE SIDE-STRIPED JACKAL

(*Thos adustus* Sundevall.)



Side-striped Jackal.

Only one sub-species is recognised and the type, originally from Magaliesberg, Transvaal, is in the Stockholm Museum.

Generally known as:—

Afrikaans: Grys-, witkwas-, silwer-, streep- of vaaljakkals.
English: Side-striped, Grey, Grey Rhodesian jackal.

According to Roberts (65), this jackal frequents the tropical regions of Southern Africa and is seldom if ever found south of the Tropic of Capricorn in Transvaal, but towards the East in Zululand and towards the west in northern South West Africa. Judging from evidence, however, it seems as if it is migrating southwards, for it has been observed in the Ermelo district, Transvaal, and also in the north-western Cape Province.

The Side-striped jackal stands 18 to 20 inches high and is thus taller than the Black-backed jackal. An adult male, according to Shortridge (73), weighs up to 30 pounds, the bitch being about 24 pounds. Sclater (69) gives the body-length as 29·5 inches and the length of the tail to the tips of the hairs as 18 inches.

The basic colour is dull grey, a little darker on the dorsal than the ventral surface. A distinct white stripe, bordered below by an equally well-defined black stripe, extends on either side from the shoulders to the hindquarters. These stripes are the origin of the descriptive English name—Side-striped jackal. The tip of the brush is pure white and this in turn gives rise to the Afrikaans name—" Witkwas-jakkals ". The ears, which are short, upright and slightly rounded at the tips, are three inches in length and are covered in front and behind with the same colour hair as the body, but as a result of the long, white hairs on the front surface of the pinnae, the ears appear white in front.

The Side-striped jackal prefers to inhabit wooded and densely-vegetated areas, especially if there is water in the vicinity.

These jackals are mainly nocturnal animals, but may also be found in the veld on cooler days. They walk or trot along the trodden game paths and can usually be distinguished from Black-backed jackals by the fact that their tails hang down.

Side-striped jackals are regarded by most writers, e.g., Roberts (65), Sclater (69), Shortridge (73) and others, mainly as scavengers, but they also have an appetite for fieldmice, birds, insects, lizards, etc. Frequently they hunt together in packs and sick or wounded game are easy prey. Due to these jackals' addiction to carrion they are usually lured into traps by this means.

They are very timid and shy, even towards other wild animals, and it is known that they prey less on the smaller kinds of buck than, for example, the Black-backed jackal. They catch their victims by pouncing on them or by running in amongst them, like the Black-backed jackal.

The evidence is very strong that Side-striped jackals do not prey on sheep, although it is maintained that recently this has become the case. Here again, then, the jackal has been deprived of its natural source of food by circumstances, but such depraved individuals can easily be trapped by poisoned bait or lured into a trap by means of carrion. It is very probable that Side-striped jackals, driven from their accustomed territory by circumstances, will acquire other habits in the new areas, especially bad habits such as sheepkilling, if the normal food is insufficient.

Like the Black-backed jackal, the Side-striped jackal also feeds on vegetable matter such as berries and veld fruit.

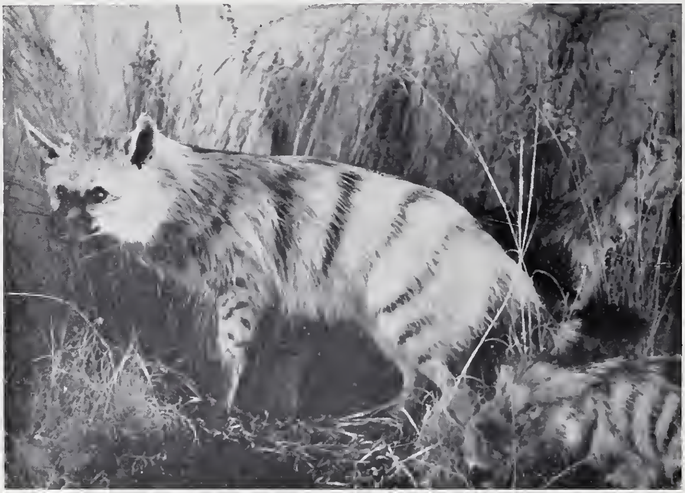
Shortridge (73) describes the cry of this jackal as a series of metallic sounding barks, repeated at short intervals, and this differs completely from the howl of the Black-backed jackal. When caught in a trap the Side-striped jackal emits deep yelping sounds, best described as part bark and part howl. Roberts (65) imitates the sound as " Hou-hou ".

The gestation period of the Side-striped jackal bitch has been determined by Stevenson-Hamilton (81) as nine weeks. Kenneth (45) gives the period as between 57 to 70 days. In the Eastern Transvaal the young are born in winter, usually from June onwards, and like the Black-backed jackal, they make use of burrows dug by other animals, e.g., the antbear. The average number of cubs in a litter varies from four to six.

Side-striped jackals, like the Black-backed jackals, mate freely with dogs but there is no existing record of their offspring.

THE AARDWOLF

(*Proteles cristatus* Sparrman.)



Maanhaar Jackal or Aardwolf.

There are two sub-species of the Aardwolf:—

(1) *Viverra cristata* Sparrman.
Type unfortunately no longer in existence, but originally from Little Fish River, Somerset East.

(2) *Proteles cristatus harrisoni* Rothschild.
Type in the Tring Museum, originally from Umpala, Mossamedes, Angola.

Generally known as:—
Afrikaans: Aardwolf, weerwolf, maanhaar, nadrou or streepjakkals.
English: Aardwolf, Nadrou jackal.

Aardwolves are fairly widely distributed throughout Southern Africa, although they do not generally penetrate to the coastal regions. According to Roberts (66) they prefer the drier areas and are frequently found in wooded regions. Although it is generally assumed that Aardwolves do not frequent the mountains there are existing records of lone ones found in the mountains of the Western Province.

In external appearance the Aardwolf closely resembles the striped hyena of North Africa. In particular, its low set hindquarters, long hair and black bands are points of similarity, but the Aardwolf differs from the hyena in that it has five toes to each forefoot, like the ordinary jackal instead of four as in the case of the hyena. The build of the feet differs also, the legs are thinner and the hair on the back is longer.

According to Shortridge (74), the Aardwolf stands 18 to 20 inches high at the shoulders, but as already mentioned, there is a characteristic slope towards the hindquarters.

The general ground colour of the body is a dirty, dull buff or light, reddish brown, with the throat regions paler, almost white in colour and the chest, abdomen and groin regions as well as the legs much brighter in hue. The general appearance is grey, due to the presence of long, stiff, yellow-white hairs, tipped with black. Very typical are the three, black, vertical bands across each shoulder. Extending from the rump over the hindquarters on each side, there is a clearly defined black band, which further on curves outwards. On each hindquarter there is a short, horizontal band also and further there are stripes on the fore and hindlegs.

Aardwolves do not have the repellent odour of the hyena, but if they are cornered their anal glands secrete a musky substance which is responsible for the typical smell which clings to them.

The Aardwolf is a nocturnal as well as a burrowing animal. By day it shelters in burrows, especially antbear earths and its presence in the burrow is betrayed by the mound of fresh ground, which partially blocks the front part of the passage near the entrance. The entrance of a burrow made by the Aardwolf itself, appears to be domed while that dug by the antbear has a high arch.

Aardwolves hunt singly or in pairs where the ants are plentiful, but according to Roberts (66) and Shortridge (74) they have been found together in groups of from five to twelve or even more. They are harmless animals and of great use because they destroy so many ants. They are accused of killing lambs and even full-grown sheep, but this occurs only in areas where veld food has become scarce. Many farmers leave Aardwolves undisturbed in their camps even though there may be lambs there.

Like the Long-eared fox the teeth of the Aardwolf are of interest to the biologist, but in this case it is the lack of teeth. Sclater (70) gives the dentition as follows:—

$$\frac{3}{3},\ \frac{1}{1},\ \frac{3}{3},\ \frac{1}{1},\ \text{i.e. only 32 teeth.}$$

The incisors and canines are normally developed but the molars are very small, almost rudimentary, and widely spaced and cannot be used for chewing.

The howl of the Aardwolf has been likened by Shortridge (74) to that of the striped hyena. When it is cornered, the Aardwolf brings its mane erect and gives vent to a grunting sound, very like that made by a pig. It is an exceptionally hardy and courageous fighter.

As already mentioned, the Aardwolf frequently digs its own burrow and if not driven from this, will retain it permanently. The young, usually from three to five, are born in the burrows towards the end of winter or early in spring and are cared for by both parents until they are strong enough to provide for themselves.

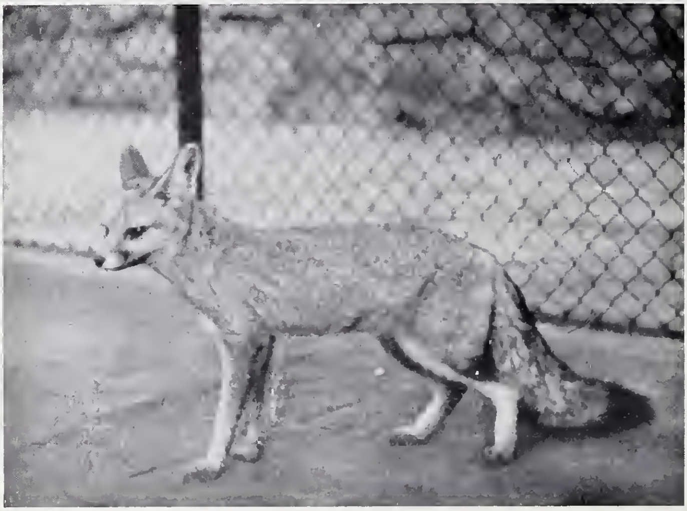
The Aardwolf never feeds on carrion and its food consists mostly of ants, especially termite, crickets, locusts and other beetles and their larvae. It also has an appetite for eggs, birds, mice and other small animals which it may encounter.

The Aardwolf moves clumsily and, in addition, is so slow that it is easily caught by dogs. Many are caught and killed by Natives who regard it as a delicacy.

Aardwolves are subject to the same diseases and internal and external parasites as the other jackals.

THE SILVER FOX

(*Cynalopex chama* A. Smith.)



Silver Jackal.

Canis chama A. Smith, later known as *Vulpes chama* and today as *Cynalopex chama*, was described in 1834 by A. Smith. The type is in the South African Museum, Cape Town and is originally from Klein Namaqualand.

Generally known as:—
Afrikaans: Silwer-, draai-, vaal-, and klein rooijakkals.
English: Silver fox.

This jackal is common to Southern Africa only. According to Shortridge (73), the distribution is south of the Zambesi. Roberts (65) states that it is found over the entire dry western region up to the northern areas of South West Africa and that the distribution extends from the Eastern Province, through the Orange Free State to Transvaal and in Natal to the slopes of the Drakensberg mountains, but not to the coastal regions.

The Silver fox differs considerably in size from the Black-backed jackal, although its tail is proportionately much bigger and more thickly covered with hair. The muzzle is much shorter and more foxlike. The body-length, according to Hewitt (41), is 24 inches and the length of the brush up to the hairtips is 13 inches. It stands about 12 inches high.

The Silver fox's coat appears silver as a result of the mingled black and white-tipped hairs. At the base the hairs are dull grey but shade to a lighter colour towards the middle. The long hairs which protrude are black-tipped, banded broadly with white in the middle. The neck and sides of the Silver fox are lighter in colour than the dorsal surface. The head is a dull rufous mixed with white hairs, while the lower lip, angle of the jaw and the lower jaw are dark brown.

The ears are large, measuring, according to Sclater (69), $3\frac{1}{2}$ inches and the hair behind them is tawny, while in front there are long, white hairs and a dull, yellowish marking at the base of each ear. There is a clearly defined black band between the knee and the heel. The tail, which is thick and covered with bushy hair, has a dull, yellowish basic colour, interspersed with hairs terminating in black.

It is characteristic of the Silver fox that it leaves little or no scent.

The Silver fox is a nocturnal animal, although it sometimes ventures out at dusk. During the day it shelters under bushes or in ditches or under flat stones. It prefers the open veld and is seldom if ever found in wooded regions.

Silver foxes are extremely cautious by nature and they must either be very hungry or the danger must be very great, for them to leave their shelters unexpectedly. They will seek refuge in the nearest burrow if they have been disturbed. Roberts (65) describes that when they are running at full speed it seems as if their bellies touch the ground. By making full use of its large tail, the Silver fox is able to execute very sharp turns and to such an extent that it tires the pursuing dogs and frequently succeeds in evading them altogether. On account of this, it has become popularly known as the " Draaijakkals ", but this unfortunately is erroneous as the real " draaijakkals " (Delalande's fox) or also named the Long-eared fox has first right to this name.

Its barking call has been compared by Shortridge (73) to that of the European fox and has also been described as similar to the yelping of young dogs. The Silver fox never howls.

The Silver fox is pre-eminently a scavenger and is generally found searching for food among the refuse of deserted camping-sites. As it is a scavenger, according to Shortridge (73), it is easy to lure into a trap baited with dead fieldmice. For this reason, also, hundreds of Silver foxes have been destroyed by means of poisoned bait.

Usually they hunt in pairs, feeding on ants, locusts, beetles and their larvae as well as on fieldmice, rock-rabbits, hares and other rodents. They have an appetite for ground-nesting birds, killing them and eating the eggs as well. Shortridge (73) states that Silver foxes also catch lizards and feed on wild berries and fruit and it is thought that they dig out juicy roots and tubers.

Under normal circumstances Silver foxes are exceptionally useful animals and if one or more of them begins to prey on sheep, only the culprits should be trapped and destroyed and not all of their kind be killed indiscriminately. According to Sclater (69), until the beginning of this century there was no record of Silver foxes ever having caught lambs. Uncared for fowls, straying from the farmyard in search of food and nesting-places, will not be scorned by any Silver fox and in this way they acquire the habit of raiding the farmyard.

The breeding-season corresponds with that of the Black-backed jackal, being usually during Ausust and September. Although FitzSimons (29) maintains that the cubs are whelped where there is adequate shelter, the breeding dens are mostly in deserted springhare, antbear, and even meercat burrows. Just as in the case of the Black-backed jackal, the presence of cubs is betrayed by the old pieces of skin, feathers, little bones, hares' feet, etc.

The Silver fox parents bring numerous mice, hares, birds, etc., to the burrow as food for the young and both parents help in the rearing of the cubs. They also have the habit of burying carrion near the burrow so that there is always a supply of food.

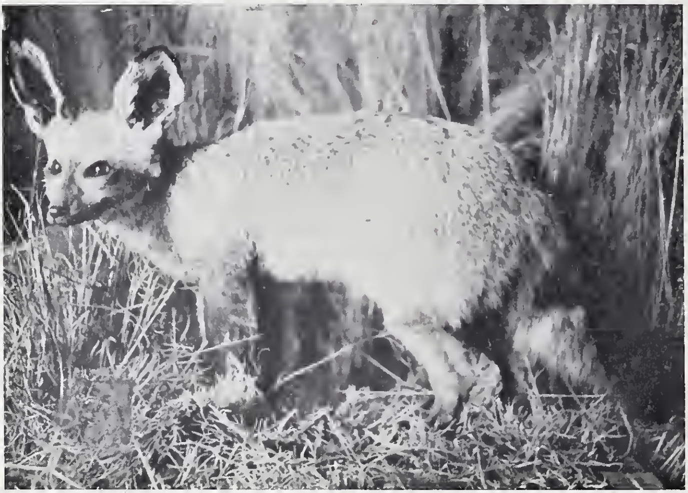
The gestation period of the bitch is given by Shortridge (73) as between 51 and 52 days, and Roberts (65) records it as seven to eight weeks. The average number of cubs in a litter varies from three to five. There is no distinguishing note in the parents' call, which is as usual, to show that there are cubs.

Silver foxes are also subject to various diseases, especially distemper, and are also liable to have internal and external parasites.

They can be easily tamed, but will always, if opportunity offers, do damage among the poultry.

THE DELALANDE'S FOX OR LONG-EARED FOX

(*Otocyon megalotis* Desmarest.)



Delalande's or Large-eared Fox.

There are two sub-species of this jackal:—

(1) *Canis megalotis* Desmarest.
Type in the Paris Museum, France, originally from the Cape Province.

(2) *Otocyon steinhardti* Zukowsky.
Type originally from Goreis, South West Africa, but unfortunately no longer in existence.

Generally known as:—
Afrikaans: Bakoor-, draaijakkals.
English: Delalande's fox, Long-eared fox, Black-eared fox.

Both the Afrikaans names are very descriptive as this fox has unusually large and deep pinnae of the ears, about 4½ inches in length, and from these the first name is derived. Equally characteristic is the habit, when walking or even running, of pivoting on one foreleg and this has given rise to the second name. It is practically impossible for the Long-eared fox to move in one direction without pivoting. This is completely different from the sudden swerve which the Silver fox executes with the help of its tail, but the ability of doubling in its tracks in this way, serves the Long-eared fox almost as well in evading its enemies as the swerve of the Silver fox.

The distribution is typically South African and as described by Roberts (65), the Long-eared fox is found in the drier regions of the Cape Province, the Orange Free State, Transvaal and South West Africa. According to Shortridge (73), it is also found in Bechuanaland but not in Natal or the coastal belt of the Namib desert.

The Long-eared fox is small in posture, standing about 12 to 14 inches high at the shoulders. The body-length, as given by Sclater (69), is 25 inches and the tail measures 13 inches to the hair-tips.

Its appearance is dark grey, the undercoat being a dull grey brown with the long, protruding hairs terminating in black and banded with white in the middle. The basic colour of the flanks, throat regions and underside is buff and the chin as well as the fore and hind-feet are black. The interorbital region is characteristically depressed. The upper part of the muzzle is light brown but it gradually shades to darker under the eyes, the eyelids being black. The inside of the ears is white, with blackish-brown upper edges, while the back of the ears is covered with dull bark-drown hair. The grey brush has a black stripe on the dorsal side, which gradually broadens towards the tip so that the tail terminates altogether in black.

The Long-eared fox has a slightly offensive odour, very similar to that of the Black-backed jackal.

Like the other jackals it is mainly a nocturnal animal, but is frequently found during the day in sparsely populated regions. Usually, however, it finds shelter during the day under dense bushes, in ditches or in burrows.

Long-eared foxes frequently run together in packs of six or even more, in search of food. They are completely harmless, of hindrance to none and, in addition, very useful little animals. For the biologist they are of interest on account of their large number of teeth. The dentition formula, as given by Sclater (69) is:—

$$\frac{3}{3},\ \frac{1}{1},\ \frac{4}{4},\ \frac{3\text{–}4}{4},$$

i.e., they have 46 or 48 teeth. Equally interesting is the fact that the fore-feet of Long-eared foxes, like those of the hyena, have four toes instead of the usual five

By nature they are comparatively quiet, their call, according to Shortridge (73), being something like that of the European fox, only not as loud. It has also been described as a groaning or sighing call. If cornered, the Long-eared fox emits a yelping sound, imitated by Shortridge (73) as "ha-ba-wa-wa".

Like other jackals Long-eared foxes are inclined to visit camping sites at night in search of refuse. They are, however, not eager to feed on carrion and will only by exception be caught in a trap baited with meat. They principally prey on insects such as termites, locusts, beetles and their larvae, as well as mice and other rodents, birds, eggs, lizards, veld-fruit and berries, juicy roots and other vegetable food. They are frequently found digging out mice or insect larvae.

The young are born in burrows and the average number per litter is from three to five. In captivity, the gestation period has been determined as 60 days but according to Shortridge ([73]) it is about 70 days under normal circumstances.

There is absolutely no reason why Long-eared foxes should be hunted and destroyed and the farmer who is guilty of this, does himself a great disservice. Unfortunately, roving dogs have been responsible to a great extent for the fact that Long-eared foxes have been almost completely exterminated in certain regions. The leopard is its greatest natural enemy although the Black-backed jackal also takes its toll.

Like the other jackals they are also subject to diseases, as well as to external and internal parasites.

Long-eared foxes are easily tamed and are playful and engaging pets.

CHAPTER 3

Methods of Control

JACKAL-PROOF FENCING

Jackal-proof fencing is an excellent subsidiary means of combating the Black-backed jackal menace but alone it does not offer a solution to the problem.

In spite of the fact that it is violently disputed by some farmers, Black-backed jackals have been known, if the need arises, to climb over the jackal-proof netting and other cases are known where the jackals have jumped the fencing. Once a Black-backed jackal has succeeded in doing this, it will do it again later with ease. Usually the places selected for climbing over are in the corners or by the wooden posts or standards. One case reported by a correspondent is of a jackal bitch which was pursued over four farms and in her flight cleared eight jackal-proof fences. A verandah naturally only checks the fence-climbers on one side.

A farmer who wishes to prove jackal-proof netting effectual, must see to it that the condition of the wire is checked regularly and this means that he must do it himself for his labourers may prove unreliable. Antbears and porcupines easily burrow through underneath the wire and if the ground is soft enough, jackals will do the same. If there is one gap like this underneath the wire, the entire length of jackal-proof netting is useless.

The principal objection against jackal-proof netting today is the high cost entailed and few farmers under present conditions are prepared to make such an investment. A certain amount of success may be obtained, in default of jackal-proof netting, by putting up more wires, either barbed or steel wire, closely spaced. A young jackal was cornered and killed by dogs against wire, the lowest strands of which were put up at intervals of three inches for the first two feet, the following wires of this fence being spaced at four inches up to four feet. It is desirable, though, in such a case to put up a fence five feet in height.

There are regions where the farmer is hesitant in putting up jackal-proof netting on account of the high rainfall which causes the netting to rust very quickly. The only solution to this is spacing the wire more closely in the existing fences. There are, however, farmers who are unwilling to undertake the erection of jackal-proof fencing on account of the soils being too sandy and this is the case particularly in the Orange Free State, just south of the Vaal River. It would seem, though, as if this is not a valid objection, for farmers in the Gordonia district have put up jackal-proof fences among the sand-dunes and according to the most recent reports, these are proving a great success. It would thus appear that the Black-backed jackal is less inclined to burrow underneath the wire than is generally assumed. From a heated dispute in the correspondence columns of *The Wool Grower* (46), it is very evident, however, that the Black-backed jackal will act according to its own inclination—those accustomed to burrowing underneath the wire will do so and those which generally climb or jump over fences, will not burrow.

When erecting jackal-proof netting, great care should be bestowed on the foot of the fence. According to all correspondents who have such fences, these will prove a success only if the foot has been firmly packed with stones. The efficacy of a jackal-proof fence appears to depend on the regular care and attention which it receives.

Much trouble is caused when a public road passes through a fenced-in area. Gates will always be left lying open and the guilty persons are seldom if ever brought to book. It is therefore in the farmer's own interest to incur the extra expense of fencing off the road rather than to make use of gates. If the losses of years are totalled, it will be found that the outlay of erecting these additional fences, is a good investment. It is maintained that a Black-backed jackal easily crosses a grid to enter a camp.

Weighed against the heavy expenses entailed, it would seem as if, where the farmer has been successful in eliminating the Black-backed jackal, it has only been done with the help of jackal-proof netting. Some jackals were killed in the fenced-in areas by poison, others were destroyed by dogs and still others were accounted for by traps, but the farmer could rid his farm of Black-backed jackals as he had the means to keep out new intruders.

Farmers living in areas bordering on Native territories complain that jackal-proof netting is damaged by the Natives by their constant climbing over the fences, but this can be remedied for, if the farmer wishes to make use of their services, he must teach the Natives either to make use of the gates or else build stiles.

Putting up jackal-proof fences in mountainous regions is naturally a difficult task but if farmers in certain parts of the Great Karroo could manage this, others should be equally successful. The objection that mountain fires damage jackal-proof fences naturally applies to all types of wire and if veld-burning is absolutely essential, care should be taken that adequate fire-belts have first been established.

The habit of riding right up against the fence when checking the condition of the wire, leads to the formation of a worn path which may later easily develop into an eroded furrow. This also brings about the denudation, round about the base of the fence, of vegetation, which plays a useful role in the anchoring of the foot of the fence.

When dealing with a fence-climber among Black-backed jackals, there is only one solution and that is to hunt it mercilessly until it has been destroyed. The jackal has the advantage that the riders and even the dogs will be checked by the wire, but today the farmer has motor vehicles and the telephone at his disposal to organise such a hunt.

TRAPS

The setting of traps is a delicate task and one at which everybody is not equally successful. Not one of the other methods employed in the destruction of the Black-backed jackal has been subject to such controversy among the correspondents.

As the Black-backed jackal possesses exceptionally well-developed powers of observation, the setting of a trap is a skilled task and only practice gives the necessary proficiency to ensure success.

In North America the field personnel of the department of " Fish and Wildlife Service " have become so skilled in the setting of traps for Coyotes, wolves and foxes that it is almost impossible for these animals to escape the traps. This department, as well as the " Michigan Department of Conservation ", has published excellent, illustrated pamphlets (31), (89) and (80), on this subject and it will be to great advantage to study their methods thoroughly, especially in conjunction with those advocated by correspondents.

Before setting a trap all the required articles, listed below should be on hand:—

(1) A canvas or sack is needed on which one can kneel with ease while adjusting the trap and which is also of sufficient size to hold the ground which has been dug out. To rid it of any alien or human scent the sack or canvas should be buried under the ground or a dry dungheap for a few days.

(2) A trowel or small scoop for digging.

(3) A piece of bent iron or a small pick-axe for breaking up the hard soil.

(4) A few traps which have been scrubbed in clear, warm water to remove any alien smells. There should be no smell of old oil on the trap, trowel, pick-axe or anything which is used.

(5) A stout wooden or steel peg with which to anchor the trap. The use of a peg is not advocated for Black-backed jackals for they are inclined to pull free or escape by twisting off a leg or even biting off a leg. Part of a heavy hoop, which cannot easily be dragged into the entrance of the burrow, or a piece of iron, weighing from five to seven pounds, which the jackal will be able to drag without being hindered by shrubs, is recommended. The Black-backed jackal must still be able to struggle on its way.

(6) Something with which to cover the pan when the trap is covered over with soil. A piece of brown paper, skin, sacking or canvas may be used provided that there is no strange smell clinging to it.

(7) Cotton wool or wool to be placed under the pan of the trap to prevent the presence of loose soil there which may impede the closing of the trap.

(8) A lure. The Americans make use of a home-made lure which is prepared in the following way. A fish with a high percentage of oil is ground and placed in a covered steel container, usually an old milk-can. A small hole through which the gases escape but which is too small for flies to pass through, is bored in the lid of the can. It was found that the hatching of maggots in the decaying fish spoilt the smell. The can is left in the sun for three days or more until the fish has completely rotted; glycerine is then added and the contents stirred thoroughly. The proportions

used are one ounce of glycerine to three ounces of fish. To this one grain of corrosive sublimate is added to prevent further decay. The lure is then preserved in suitable bottles.

In South Africa farmers have found that once one jackal has been caught the procedure becomes easier. The jackal is killed and the bladder removed, filled with water and hung up. After three days the contents of the bladder will prove an excellent lure. If the bladder is that of a ruttish bitch, the contents will serve almost infallibly as a lure. The urine of tame jackals may also be used with success. The bladder of a Black-backed jackal, caught in a trap, is usually empty as the jackal micturates repeatedly and it must therefore be filled with water.

In Bechuanaland the Natives leave the brain of a sheep to dry in the sun and when completely dry, it is finely ground. The smell is almost unendurable but it is an excellent lure.

Some farmers have used traps successfully without lures by sprinkling the ground with clean water until it is wet after the trap has been set.

(9) Gloves. The Americans believe that gloves are essential and these are buried with the canvas used for kneeling to eliminate any alien scent. Canvas gardening-gloves are most suitable.

The next stage is the selection of a suitable site for setting the trap. This should not be done in a haphazard fashion in the hope that the jackal will come across one, but all tracks at gaps in fences, burrows in the veld, footpaths and farm roads, should be carefully examined, care being taken to ensure that human tracks are reduced to a minimum. Black-backed jackals have a preference for using footpaths and paths trodden by stock, old, deserted cart roads and sandy, eroded furrows. They prefer sandy soil to hard, gravelled ground. The paths used by them should be sought in the open veld rather than among bushes or broken veld.

The Black-backed jackal like dogs and its relatives in North America has certain posts where it micturates regularly—a piece of old evil-smelling skin, a shrub previously visited by another jackal, offensive smelling excrement of humans and animals or any place where the jackal becomes aware of a lingering smell which will give rise to the need to micturate. A clump of grass or a shrub, partially obtruding into the path, a stone or antheap, a fence post or any object in the vicinity of the path should be carefully examined for such signs as micturation stains. A popular site for setting a trap is where two footpaths meet.

Other places which should be investigated are where stones, logs or any other natural object obstruct the footpath. Black-backed jackals generally jump these obstructions and the place where they land on the other side is usually ideal for the setting of a trap. It is of no avail to try to trap jackals in the little passageways among bushes or rocks for, where possible, they leap through these. So the correct positions for traps would be just in front or immediately behind the passage.

It is frequently necessary to prepare a suitable trapping-site a few days ahead. A stone can be placed as naturally as possible across a path or a micturation post artificially created by means of lures. As soon as it has been determined that these are effective, the trap may be set.

It is most desirable that when investigating or later when setting the trap or checking on this, the farmer or person responsible should go on horseback. Black-backed jackals with the exception of the cunning, old rogues, are afraid of human tracks. It has been experienced that such wily jackals as the latter follow in human tracks and sometimes success in trapping has been obtained by leaving a neat shoe-print on the set trap. Such a jackal is so cunning that if it becomes aware from the tracks that the man has delayed there, it will turn away into the veld and only rejoin the path further on.

When the footpath is used by game, which cannot be removed from the camp like sheep or cattle, a micturation post must be artificially created about a yard from the path. Not only game but other useful little animals may also be caught in the trap. It is necessary to offer such enticement to the jackal, for if any other animal springs the trap, this may be removed, for a Black-backed jackal will never be trapped there.

Once a suitable site has been selected or prepared, it is wise to approach it through the veld rather than along the path, even though on horseback. A well-trained horse, which will remain standing in one spot until the work has been completed, is an asset, for as few tracks as possible must be left. It is maintained that it is useless for anyone perspiring freely, to set a trap, as the smell of the perspiration lingers for a long while.

The procedure of setting the trap is as follows: First the canvas is spread open on the most suitable position and all the other requirements placed on it. Care should be taken not to step in the path or to touch the ground with the hands. A shallow hole, just large enough to hold the trap and the anchor, is made in the path with the trowel, about six to eight inches from a clump of grass or a shrub and the ground is shovelled on to the canvas, for the ground must not be touched by the hands. As it is desirable to break the surface of the ground as little as possible, a flat piece of iron, which can be fitted under the trap, may be used as an anchor. The only disadvantage, though, is that a piece of iron like this can be dragged into the burrow and this means digging out the jackal afterwards.

It is recommended that traps be set on either side of the path at the decoying-site so that if the wind blows the jackal will not pass all the traps.

As soon as the hole is spacious enough, i.e. if the open jaws are not pinned against the sides and the set trap can be bedded about $\frac{1}{2}$ inch below the surface of the ground, the trap is set. Care should be taken that the trap is not too finely adjusted. The trap should first be carefully examined at home and any necessary adjustments made, but no oil should be used on it. The trap should strike only when the weight of the jackal shifts to the foot resting on the pan of the trap. When the trap has been set, pads of cotton wool or sheep wool should be carefully stuffed under the pan to prevent loose soil from impeding the action of the trap. Cotton wool and wool are resilient and will not prevent the pan from being depressed sufficiently. To a certain extent these also prevent the trap from being sprung by lighter animals such as pole-cats.

A piece of brown paper, sacking, canvas or skin must then be carefully placed over the pan, but care must be taken that it does not extend over the jaws as well. If the cover is too large, it must be passed underneath the jaws, and this serves as a second precaution that loose soil will not collect under the pan. It should be seen to that the free working of the tongue of the trap is not obstructed. If old, dirty scraps of wool are plentiful, it is desirable to omit the piece of brown paper or whatever is being used for the pan cover, and to fill the whole space underneath the pan and between the jaws with wool, for this leaves the tongue of the trap free.

The trap is then carefully covered over with ground which is first strewn round the outer edges of the imbedded trap in a ridge until the jaws are hidden and then carefully worked towards the middle so that the whole trap is covered. Preferably the ground which hides the trap should be lower than the surface of the surrounding ground but it is essential that it should not be higher than this for the jackal will cautiously avoid the slight rise.

The scent to be used as lure is then sprinkled over the shrub or placed near the foot of the shrub in line with the trap. A small pad of cotton wool or wool, soaked in the scent, may be buried at the root of the shrub. Damp weather causes the scent to evaporate quickly. Thus, if an artificial lure is used, it is desirable that this should be renewed every third day. During dry weather a renewal is necessary only every fifth day.

The ground surface of the location must be restored as naturally as possible to its former state by obliterating all tracks, etc., by means of a twig or a bunch of grass. Twigs, dry grass and stones should not be placed over the trap as the jackal avoids stepping on these. It has a preference for soft, clean soil and this may be strewn over the hidden trap.

All the tools must then be collected and the canvas with the surplus ground carefully lifted. This surplus soil must not be deposited in the vicinity of the trap but taken far away. By walking backwards when leaving the site of the trap all possible tracks may easily be wiped out.

It has been suggested that large tins should be worn over the shoes so that no shoe-prints are left, but this is a tiresome encumbrance. If the soles of the shoes are treated with a little of the scented lure, it will lessen the human smell.

Correspondents also recommend that the ground surrounding the trap should be sprinkled with clean water or that fine, dry horse-dung should be strewn there to remove the human scent.

A Black-backed jackal is very wily and if it comes upon a place which to it appears suspicious, it will begin to dig, sometimes starting as far away as six feet from the trap. Once the trap has been discovered the jackal makes off and the trap might as well be removed for no matter how long it remains there, no jackal will be caught by it.

It is absolutely essential to visit all the trap positions every morning, for to leave any animal, even a Black-backed jackal, caught in a trap longer than necessary, is unpardonable cruelty. Sometimes a harmless animal may have been trapped or one of the most expensive rams. When checking the traps, all the necessary equipment for re-setting the traps and a rifle should be taken along for putting the captured animal out of its misery.

When traps are set near the breeding-dens, the tracks should be carefully investigated and a suitable position selected in the path or travel way used by the Black-backed jackal. If it is an antbear earth there will be a little mound of loose ground in the entrance of the burrow and no jackal will walk over this. Frequently traps are set only at the entrance of the burrow, but it is desirable to have a few in the footpaths as well. In such cases it is recommended that a trap with a long chain with a hoop attached at the other end, be used, as this cannot be dragged into the burrow.

It should be realised that if there are cubs in the burrow, both the male and bitch keep watch from a distance over the burrow and thus extra care should be taken in setting up a trap, for the parents will not rush back blindly to the burrow. In North America it has been found that if the cubs are accessible, it is best to kill them and to bury them near set traps in such a way that a foot protrudes above the surface of the ground. The Coyote bitch will linger in the vicinity of the burrow for a long while and when she attempts to unearth the buried cubs, she will be caught in the trap.

Because the Black-backed jackal has the habit of carrying the cubs to safety, when the burrow has been discovered, it should be determined that there is not more than one exit, for otherwise the cubs will be fetched out by another way and the whole family will escape unscathed.

The setting of traps in gaps in fences frequently succeeds in practice but unfortunately so many other useful animals are caught that precautions should be taken to avoid this. The lower part of the gap should be filled in so that it is impossible for antbears, for instance, to crawl through, but in such a way that jackals can still jump through. When it has been determined that the jackal still makes use of the opening, the surroundings should be thoroughly investigated to locate the positions from which the jackal takes off for the jump and where it lands afterwards. In this case traps must be set on either side of the fence. According to a correspondent, if a farmer perhaps wishes to encourage the entry of antbears, sacks can be draped over the gaps and if the human smell still clings to these the Black-backed jackal but not the antbear will be deterred from crawling underneath. A regular round should be made and the sacks handled or others substituted for them. Sacks on which dogs have slept are very useful for this purpose.

If traps are to be set by the carcasses of animals, which have been victims of jackals or else have died of natural causes, it is preferable that these should be in a circle but a few yards from the carcass in the centre. The Black-backed jackal has the habit of not approaching carrion directly, but of circling round it and gradually drawing closer until it is certain that there is no concealed danger. If the traps have thus been set in strategic positions, the jackal can be easily trapped.

A Black-backed jackal cannot resist the temptation of rolling on something with a bad odour and the more offensive the smell, the more easily it is enticed. A dead pole cat or hare, encircled by traps, is therefore a way in which jackals are easily trapped. The Natives of Bechuanaland know from experience that if evil-smelling, finely-ground dried brains are placed on the pan of a set trap, the jackal will dig there and this accounts for the ease with which they trap it. Mr. J. C. MacDonald, Game Inspector, Loskop Dam Reserve, has achieved considerable success in trapping by the use of ox brains. The brain was removed and kept in a jar until well decomposed. An enclosure was made with thorn-tree branches and a trap set in the entrance of this while the brains were strewn inside. No attempt was made to disguise the human smell and yet a number of Black-backed jackals were trapped.

The choice of the type of trap used depends on the person who sets it. A trap with jaws not shorter than three inches and not longer than six inches is recommended. Traps with smooth jaws are preferable as those with serrated edges usually break the leg. The double-spring type is the most reliable and there is no chance of pulling free. If the jaws are too small the chance of making a catch is slight and if these are too big the legs are easily broken.

The setting of snares of smooth wire cannot be condemned too strongly and if these are placed in the gaps in fences, they are a permanent danger to other useful animals as well as to the farmer's own dogs.

Another equally merciless way of trapping is by the use of shark hooks, baited with pieces of meat or rectum, and suspensed at a height within reach of the jackal when it jumps. If the jackal bites this bait it will remain hanging there and unfortunately the useful jackals are mostly caught in this manner, as the Black-backed jackal, once it has become addicted to sheep killing, pays little attention to carrion. According to Young and Goldman ([90]), the same method was used in North America to trap wolves.

An old remedy, used by farmers, has been described by Mr. Seymour, editor of *Farming in South Africa*. A round hole, just large enough for a jackal to force its head through, is cut in the middle of a dry ox hide. Carrion, usually the entrails of sheep, is then dragged across the farm and eventually deposited in a hole, 12 to 18 inches deep. Over this the hide is pinned tightly with pegs, with the opening in the hide in position over the hole in the ground. When the jackal has forced its head through and begins to eat, it soon becomes suffocated and the more it struggles to release its head, the more tightly it becomes wedged. The objection here again is that it is not so much the Black-backed jackal which is vulnerable to this type of trapping, certainly not the habitual sheepkiller, but rather the useful Silver fox.

It is waste of time to construct trapping pens or enclosures foı jackals. Sometimes small enclosures are built and carrion or live lambs used to entice the jackals. Traps are placed in the gate or at other possible gaps, but the Black-backed jackals must be exceptionally numerous or there must be a great scarcity of food, for this method to be successful.

To summarise, it may be mentioned here that correspondents advocating the use of traps are agreed that though these may be used successfully in areas fenced in by jackal-proof netting, traps cannot be considered as a means of extermination unless these fences are present.

FOXHOUNDS

By fencing with jackal-proof netting and hunting with well-trained dogs, many farmers have succeeded in ridding their farms and the surroundings of Black-backed jackals. Where it is not possible for some farmers to fence with jackal-proof netting, they can achieve considerable success with the help of good dogs and other methods of destruction.

The Black-backed jackal has speed. It can maintain the rate of almost 40 miles per hour over a distance of one mile and since, for the greater part, it lives as a hunted animal, it can keep up a considerable pace, averaging 25 miles per hour, for many miles. Sometimes even horseback riders find it difficult to keep up with the jackal. In such a case it is worth while transporting the pack of dogs by motorcar or motor lorry as this will give them a breathing-space before resuming the race.

The surroundings play an important role in the use of dogs. It would seem as if Black-backed jackals, ranging on ridges and densely vegetated mountains, have too great an advantage over the dogs, especially if the jackal knows the area, for these to be used with success, but well-known hunters are of the opinion that dogs follow the trail most easily in these parts. On the open, even plains, the jackal, unless it has had too great a start, will not be able to keep ahead once the hounds have got the spoor, but the difficulty lies in first uncovering the trail. It has been found that among dense undergrowth and bushes on even veld, a slow dog which can keep the line and has stamina, is a match for the Black-backed jackal.

Dinner time.

(Photo: N. J. v. d. Merwe)

The Black-backed jackal is not cowardly. It is true that it will flee if warned in time of approaching danger, but frequently it is surprised by hunters and dogs and then it considers it safer to lie motionless, even though the pursuers may pass by it closely. Unless the pack of hounds numbers one with good scenting-power, the jackal will not be detected and it will wait until it considers all danger safely past and then escape stealthily in the opposite direction.

When cornered, a Black-backed jackal will fight back fiercely. If the dog is not hardy, the jackal will fight its way free, though the dog need not necessarily be a weakling. It is a good hound with courage which ventures to attack a Black-backed jackal at night.

If the odds are too heavy and the jackal sees that there is no hope of escape, it will feign death and if its attackers allow it the least chance, it will try to elude them. The Black-backed jackal is very hardy and the dogs generally have to savage it badly before it succumbs. Sometimes when a Black-backed jackal is overtaken by a pack of dogs, it lies down with its head half-hidden between the fore-legs prepared to submit to the mauling of the dogs. This is no incitement for the dogs to attack and unless the hunter is there to destroy the jackal or to urge on the dogs, it will escape.

In defence of their young, Black-backed jackals are animals not easily to be dared. A greyhound, unable to succeed in biting to death a yelping cub, was so fiercely tackled by the frantic mother that it would have been lacerated, had not its owner intervened. Another case of a dog tied at the entrance of a breeding-den to prevent the removal of the cubs during the night and found killed the following morning, has already been related.

In flight before a pack of dogs, there is little which will check a Black-backed jackal. The only means thus far proving a success, is a well cared for jackal-proof netting fence, but as already mentioned, given the least opportunity by the dogs, the jackal in its extremity will find a way over this. Water is no obstacle and a dog hesitating on a river bank, will not overtake the jackal again. There is one record of a Black-backed jackal rushing into the sea, but the pursuing dogs overtook it behind the breakers. There are various other records, already mentioned, of Black-backed jackals trying to hide by lying submerged in water with only their masks protruding.

A Black-backed jackal, tired by the chase, will seek refuge in the nearest earth, though this may frequently be occupied by porcupines and the poor dog which ventures to follow will suffer painfully. If the riders cannot keep up with the chase on account of being hampered by fences, it is imperative to have a dog with good scenting-power, as those which depend on their sight may easily lose the line when the jackal flees into a burrow. A hunted jackal makes use of the opportunity of bolting into a burrow, if there is one, when sheltered by bushes or stones for then it is temporarily out of sight of the pursuing dogs. If the dogs run past without investigating the burrow, the jackal will slip away in the opposite direction as soon as it considers it safe.

The ideal dog must therefore have speed and stamina, good sight and scenting-power, and also be strong and hardy, if it is to succeed in destroying the Black-backed jackal. At present, unfortunately, there is no such kind of dog and though sometimes by cross-breeding an excellent dog is produced, there are equally many complete failures. It is therefore necessary that a pack of dogs should consist of more than one kind and in South Africa foxhounds, greyhounds and fox terriers have been used in the same pack with good results.

A foxhound has the attributes of very good scenting-power, stamina and attack. It has been bred through the centuries to keep the line although this may be crossed by other tracks, even that of another fox. The breeding of the foxhound for this specific aim is of such long standing that it is very doubtful whether its abilities can be improved upon by cross-breeding.

There are three types of foxhounds which are of importance for South African conditions:—

(*a*) English Foxhound: A strong, sturdy dog with fairly large catlike feet with very straight digits. These dogs are very well suited for heavy, soft ground and muddy, cultivated lands and in England are used for hunting during the winter. Unfortunately, in South Africa they are frequently handicapped by their feet for these do not wear as well on dry, rough surfaces as on soft ground. They are well-built dogs with the necessary speed and when the fox has been unkennelled maintain excellent drive.

(*b*) Welsh Hounds: These dogs have rough, wiry coats and are used mainly in the Welsh mountains. If their coats had not been so thick they would have been ideal for South African conditions. They have hare feet with strong oblique digits. These hounds have excellent scenting-power and good voices to proclaim their presence. They have exceptional patience in persevering in spite of unfavourable conditions but unluckily they are inclined to hunt on their own and have difficulty in differentiating between various lines. They will easily hunt other animals, even domesticated animals.

(*c*) Fell Hounds: These are lighter in build than the other two types and are used in the hills and mountains of the border regions of England. They have excellent feet and hunt admirably under

> South African conditions. Fell hounds are active, have the necessary pace and tremendous drive on the line. They are very resourceful and practically the only detriment is that their voices are poorly developed.

Many correspondents have expressed their disappointment with regard to the foxhound. It is argued that their feet are too soft for the hard, dry ground here and that their joints become stiff. This is quite understandable and to be expected, for these dogs have been bred for centuries to have feet suitable for England's soft, saturated earth and even there they are used only during winter. This is not sufficient reason, however, to condemn all foxhounds. Frequently packs of Harriers and Beagles are used, which are not used even in England for hunting foxes because they are too small and lack speed.

The fell hound was first introduced into South Africa only a few years before the last war and then it was not even a thorough-bred fell. The owners of fell hounds in England are very proud of the strain and not eager to sell. Since the last war, however, a few thorough-bred fell hounds have been imported.

Mr. P. Wilson of the Rand Hunt Club, Johannesburg, assuredly one of the best judges and breeders of good foxhounds in South Africa, has found that a foxhound with as much fell blood as possible and about 25 per cent Welsh strain and the rest English foxhound strain, does well in South African conditions. By this cross-breeding the thick coat of the Welsh hound becomes thinner and more like that of an ordinary wire-haired terrier, but the dog retains all the good traits of its forebears. Another important aspect which is also achieved by this, is the improvement in the formation of the foot.

When English, Welsh and Fell hounds are crossed, this does not imply hybridization, for these are three varieties of the same race with a common ancestry dating back hundreds of years.

Wilson ([87]) is of the opinion, that when hounds are bred for use in South Africa, it should be remembered that scenting conditions in this country are very poor for the ground is hard, rough and mountainous and thus the hounds must have good scenting-power and feet. Also, because it is difficult to keep up with the chase, the hounds should have good voices to proclaim their position to the hunter. According to the same authority the Welsh blood will account for the voice and nose, the Fell blood for the feet, speed and self-confidence and the English blood for the sturdy build and perserverance.

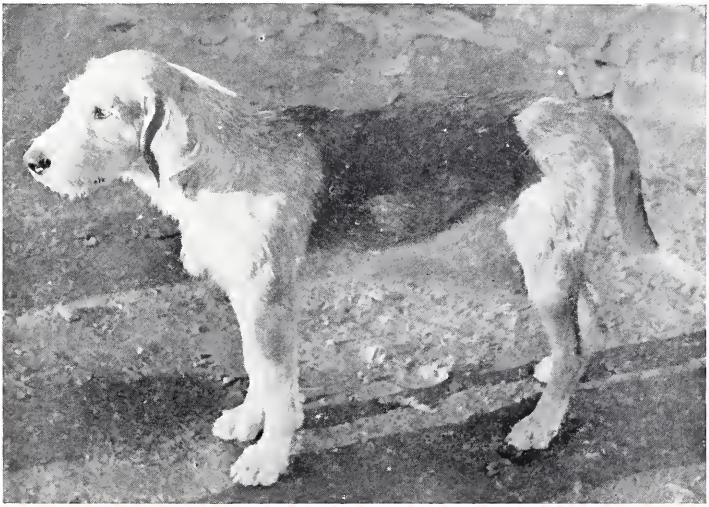
With the unselfish advice of Mr. Wilson, an attempt is being made to breed foxhounds suited to South African conditions, on a large scale, at Panfontein, the Provincial Game Farm, Bloemhof, Transvaal. As these dogs are bred and trained in a dry climate, it is very probable that they will be even more successful in areas having a more favourable climate. Some of the best dogs offered for sale in England, have been imported for these kennels.

The second breed of dog used in the pack is the greyhound, on account of its excellent sight and great speed. The drawback of the greyhound lies in the fact that it has not been bred for endurance, for it is capable of short, fast sprints but cannot cover long distances at a great pace. The greyhound is a very willing worker and it frequently happens that it is not allowed sufficient rest by incompetent persons, so that it is no exception for a greyhound to die of over-exertion on a warm day in pursuit of a jackal.

The greyhound's breeding dates back for centuries and though hybridization may give a little endurance this does not necessarily mean that the hybrid is an improvement. About a century ago the greyhound strain was introduced on a large scale among foxhounds with the specific aim of increasing the speed of the latter.

A thorough-bred greyhound unfortunately has the fault that it is not hardy and as the Black-backed jackal, when attacked from behind, usually swerves round and bites its attacker in the chest, fore-legs and head, it frequently occurs that the greyhound lets go. It has also been experienced that unless the greyhound is trained from puppyhood to bite, it will take part in the chase only without harming the jackal. This, of course, is most exasperating to the hunter.

As the greyhound dog, like other male dogs, refuses to attack a ruttish jackal bitch, it is desirable to use a greyhound bitch as well.



Piper (First Crossing between Fox and Welsh hounds).

(Photo: N. J. v. d. Merwe)

Many correspondents recommend the offspring of a greyhound bitch crossed with a foxhound dog (or the other way about) as the ideal dog for South African conditions. Unfortunately, the lurcher is also the ideal game hunter and this has been proved repeatedly in England, for its main fault is that by the cross-breeding, the dog has largely lost its ability to differentiate between various tracks. It still has good scenting-power but it keeps to any line and not only that of the jackal, which is the chief merit of the true foxhound. Further, it does not possess the speed of the true greyhound and although it has more endurance than the greyhound, this is still less than that of the foxhound. Its sight is better than that of the foxhound but not equal to that of the greyhound. Extensive experiments will, however, have to be carried out before this breed can be either condemned or recommended.

The third breed of dog essential in a pack used in South Africa to hunt Black-backed jackals, is the Fox Terrier. This is the ideal dog when it is necessary to fetch the jackal out of an earth, and though it may be equalled in prowess in doing this, there is none better. Fox Terriers also have been bred for many years for this specific aim and cross-breeding with other dogs can only detract from their ability. They are small enough to enter most burrows and in any case wherever the Black-backed jackal can accommodate itself, the Fox Terrier can follow. They have the courage and daring of fighters and one which has been trained from puppyhood to hunt, is worth its weight in gold.

Good breeding and thorough training apply to all breeds of dogs used for jackal hunting. Unfortunately, in South Africa the idea of jackal hunting is all too frequently distorted. If practised correctly, this can become a high-ranking sport.

Jackal hunting in South Africa entails hard work but unfortunately it is all too frequently regarded as a social gathering or else as an opportunity of seeing whose dog can account for the most steenbuck or hares. The hunt should not merely be regarded as an outing or as an escape from the usual duties on the farm, and politics, religion, relationship, etc., should not be allowed to mar the organisation, as so frequently happens.

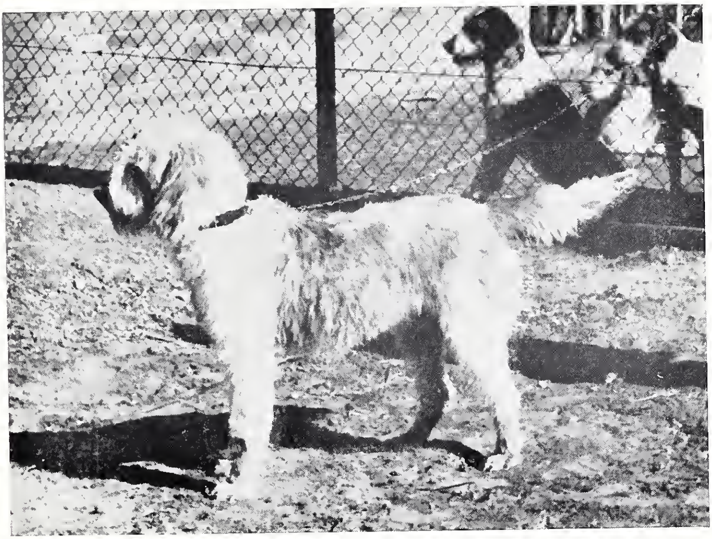
An important factor, which is often ignored in South Africa, is that in this climate the hunt should start as early as possible in the morning. A foxhound can work successfully only if there is still dew or a little dampness on the vegetation. The hound does not depend so much on the scent rising from the tracks on the ground, on account of the lack of ground moisture, but mainly on the scent left behind by the jackal on shrubs and grass tufts, as it has passed by them. Here and there jackal scent remains and this is the line which the hound follows. Thus it does not keep its nose to the ground, unless, naturally, there is no vegetation, but carries its head fairly high and is able to give tongue to call or urge on the rest of the pack. Once the sun is up, these scents evaporate and it is of no avail to take out foxhounds; any other dog will serve as well, provided it can hunt. No success can be expected on a line left more than eight hours previously, though the foxhounds may be of the best to be found.

Of all the explanations of the deceptive scent of foxes, that of Pollard ([59]) is by far the most acceptable. According to this writer, it would seem as if the scent, i.e., the substance secreted by the pad, anal and skin glands of the English fox (and it may safely be assumed that the same is true of the South African jackal), may be classed with the so-called fatty acids and related compounds. These substances are not volatile and will thus not evaporate easily; therefore, the scent left behind on very dry ground or gravel, will be followed by the hounds with great difficulty. It is another matter, however, if the scent is left behind on wet undergrowth or on moist ground.

Although the scent is not soluble in water, the latter plays an important role in the diffusion of the scent. Like oil, the scented substance will spread over water surfaces and as the quantity is so small, the layer will frequently have the thickness of only one molecule, provided of course, that there is sufficient moisture. The substance also decreases the surface tension of the water and consequently promotes evaporation of the latter. As soon as the moving water molecule leaves the surface in the process of evaporation, the scent molecules are forced out and once these are in the air, they are subject to the laws common to ordinary gases, viz., among others, that they will be distributed in space.

Pollard's (59) theory is supported by the fact that in England, with its climate of high water content, hounds find it difficult to keep the line on days when there is almost no evaporation because the air is already saturated. The lack of evaporating moisture in the dry regions of South Africa is thus the reason why it is imperative for a successful hunt to begin very early in the morning, since the slight amount of moisture condensed during the night disappears with the first rays of the sun.

In contrast to this, it has been found that when there has been frost, as is so typical of the higher-lying, drier regions of this country, it is necessary to wait until the frost has thawed before beginning the hunt. The frozen moisture must first melt before it can evaporate.



Foreman (Welsh Hound).

(Photo: T. J. Steyn)

From the facts given above, it is clear that the water content of the air and the amount of moisture on the ground, are important factors influencing the successful use of foxhounds for jackal hunting. Two other factors, viz., wind and heat in their turn determine the amount of moisture present. The heat referred to is not only that of the sun but also heat emanating from the ground itself.

Ultra-violet rays in sunlight and ordinary soil are both excellent deodorants, so that it may occur that even though there is sufficient moisture present, the sunshine will destroy the scent of even a fresh line. Newly ploughed lands will absorb so much of the scent that the hounds will find it difficult to follow.

It is imperative that the hunters should meet not later than dawn and that the hunt should be started before sunrise. It is not desirable to commence while it is still dark, for then the hounds do not work easily and it is difficult for the hunters to follow them.

A mistake which is usually made, is to make use of good foxhounds in an area which is combed by beaters. For this type of hunt it is far better to make use of other dogs since for the foxhound this is a pointless hunt as it need not depend on its sense of smell and it can only become spoiled.

A great asset of the foxhound is its powers of perserverance. When a jackal has been unkennelled, greyhounds and other dogs are inclined to pursue it full tilt, naturally to bring it down as soon as possible, but with the result that they soon become too tired to continue and the jackal escapes. In contrast, the foxhound does not start off at full speed, but keeps doggedly on the line, until afterwards the jackal is spent or seeks refuge in a burrow or any possible shelter. Hunters should bear in mind that a Black-backed jackal, after its initial, wild attempt to escape, will quickly estimate the speed of its pursuers and fit its own pace accordingly, so that it can keep ahead. It becomes a contest of stamina. The persistent barking of the hounds makes the jackal panic-stricken after a while and to such an extent that it expends its last energy in a wild, desperate effort to escape, and consequently falls an easy victim.

If an area is combed for a jackal, there should be sufficient helpers and as many dogs as possible. The foxhounds should not be used until the jackal has been driven out and if they are well rested and able to pick up the scent, they will bring down their quarry.

In contrast to this type of hunting by driving out the jackal, there is the method used in England, viz., the hounds seek the line or are brought to it and the riders must see to it that they keep up with the chase. This is the only proper method of hunting with good foxhounds for they have been bred and trained for this.

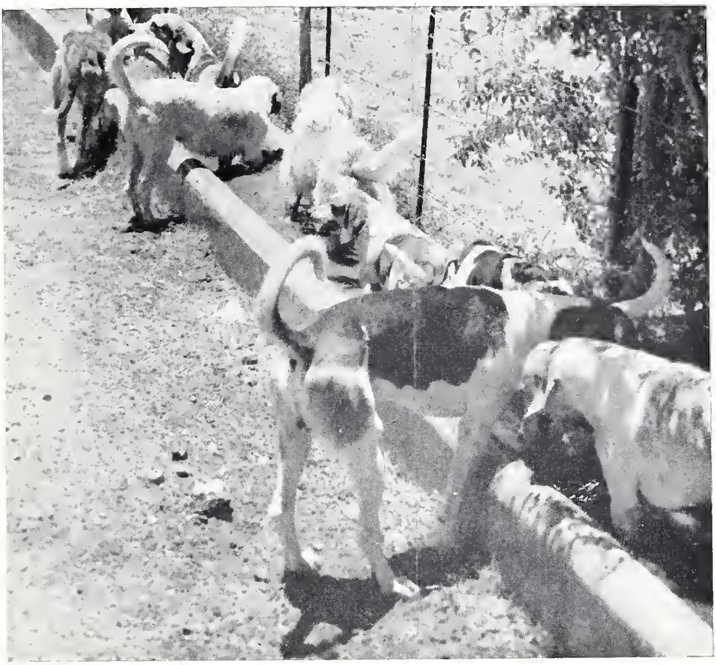
With a few exceptions, all correspondents have advocated the founding of more clubs for the destruction of vermin, but all have stipulated repeatedly that there should be full co-operation. It is most unfortunate that so many of these clubs have dissolved on account of lack of co-operation on the part of its members.

When a pack of trained foxhounds is used on the hunt, the hounds must hunt only under supervision of their trainer and even the captain of the club must yield to this arrangement. The trainer will decide what time the hunt should begin, how it should be carried out and when it should cease.

It is essential, when using trained foxhounds, that all other dogs on the farms should be left at home, even though they may be excellent hunters. It is too much to expect that even the best trained hound will keep to the line if another dog, persistently barking, follows a steenbuck track at full speed or bolts after a hare. It will involve months of hard work to correct such a fault.

It is equally essential that there should be regular hunts. The Black-backed jackal is extremely cunning and once it has found a way of eluding the sporadic hunts, it will be difficult to run it to earth. If it has succeeded in evading a poor pack of dogs, they will not catch it easily. In contrast to its usual habit of approaching against the wind, the Black-backed jackal, when trying to elude dogs, will always flee down-wind for then it is in a position to know exactly where its pursuers are. This should be remembered on the hunt when persons are placed in positions along the probable route of the jackal.

Dogs should never be used in fenced-in areas where poisoned bait had previously been distributed. Strychnine exposed to all weather for more than two years, will still prove fatal to any dog. Even though the farmer may have taken every precaution, it is almost impossible to collect all the poisoned bait which has been set out. Mungoose, polecats, birds, etc., carry these about.



Play after work.

(Photo: "The Farmer's Weekly")

A good habit is for the farmer to take his dogs with him when he goes to the veld, for if there is a strong scent of dogs in the fenced-in area, the Black-backed jackal will be wary of entering this unless it is very bold or very hungry.

It has been suggested that a full-time official be stationed in every town with a pack of trained hounds. This is, of course, an excellent plan, provided the farmers themselves are prepared to guarantee it. Where there, are various clubs in one district, this can easily be brought about by co-operation. There are a few progressive farming communities which have adopted this plan and to them the Black-backed jackal is no longer a problem.

There are a number of privately owned packs of foxhounds in South Africa and the owners rid not only their own farms but the surrounding area of Black-backed jackals.

The objection that one pack of hounds cannot serve a few clubs satisfactorily will be valid for the first while only. If there is complete co-operation, the Black-backed jackal will gradually be mastered and one pack will suffice. In South Africa a pack usually consists of eight foxhounds, two greyhounds and two fox terriers and, if necessary, this pack can be divided into two. Too many dogs can easily mar the hunt. One correspondent who has his own pack of dogs, is of the opinion that a pack consisting of four to five dogs answers the purpose best and the possibility that one or more will lag behind or stray, is eliminated.

It is not necessarily only the wealthy farmers who can afford to maintain a pack, but if this proves difficult to the individual, a club or even two or three clubs can undertake this as a combined effort.

It is absolutely essential that a pack of dogs should have one trainer and that he should have sole control of them while hunting. He should also be responsible for their care and further breeding. The dogs should be housed together in kennels specially planned for this purpose. They should not be accommodated in disused fowl-runs or any conveniently empty pens and the deplorable habit of farming out the dogs to be cared for by members of the club, cannot be too strongly condemned. The members of the pack must sleep together, feed together and live together in the same run for this knits the pack into a unit and when taken out they will hunt as a pack and not as individuals.

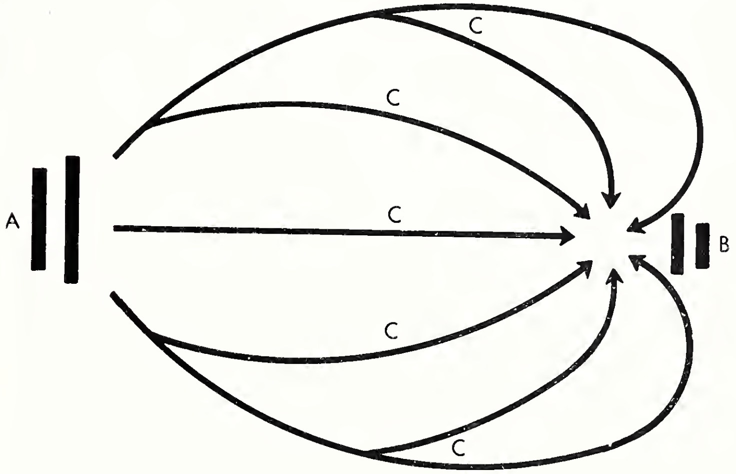
The salary of the trainer is usually an expensive item for a good trainer can only be procured at a good salary. It is therefore generally much cheaper if one of the members of the club who is genuinely interested in the dogs undertakes their training. This is far better than that a poor trainer, satisfied with a small salary, should be appointed. If one of the members of the club undertakes the training the kennels should be built on his farm.

A non-European labourer is also required for the cleaning of the kennels and the preparation of the dogs' food. If possible, he should be accommodated in or near the kennels in order to quell any fights or to put a stop to unnecessary barking.

With regard to food, the dogs must be provided with sufficient meat, mealie porridge, vegetables and milk. The problem of procuring an adequate supply of cheap meat can be solved by the purchase and slaughter of donkeys. If difficulty is experienced in keeping a large supply of meat fresh during summer, a small, cheap cold-storage room can be built. Young dogs must have sufficient milk, for this is necessary for a sound constitution.

The initial outlay on the purchase of the dogs, the construction of the kennels, etc., is heavy, but this should be regarded in the light of an investment. When young dogs are bred and sold, their sale will redeem a great part of the original expense. Hunting with foxhounds should be ranked in the first place as a farming concern but if correctly practised, it can become a popular sport, which has been exercised for centuries in England and other countries such as France and America.

As already mentioned, the encircling method of hunting, which is so commonly followed, should not be confused with the normal use of foxhounds. When the encircling method is used, a certain area is combed by riders and beaters on foot with as many dogs as possible. All these converge slowly on one position, where persons armed with rifles and accompanied by dogs, lie in wait for the jackals which are driven out, and the aim is to trap the jackal in the circle so that the dogs can destroy it. This may be illustrated diagrammatically as follows:—



A = Point where hunters meet.
B = Ambush (downwind if dogs are used).
C = Routes followed by drivers, beaters and dogs.

As described by Young and Goldman (⁹⁰), this method is also used in North America in the control of the Coyotes.

In contrast to this, a hunt with foxhounds starts from a certain point. The hounds quest for the line or are brought to it and once one has uncovered the line, it gives tongue as a signal for the others to join it. The riders must keep up with the chase and if the jackal flees into a burrow, the riders must help the dogs to unearth it. Every farmer knows the beat of the jackal on his farm and it is his duty to bring the dogs there so that they can uncover the line as soon as possible. If the dogs first have to quest blindly over the whole farm it may become too late for them to hunt properly. For this method of hunting it is absolutely essential for the hunt to begin very early in the morning. When greyhounds and terriers are taken out as well, they should be kept with the riders until their services are required. In the encircling method of hunting, the time of commencement is not such an important factor.

Both these methods have their advantages. In dry, arid regions the encircling method is perhaps the best, for unless conditions are extremely favourable, there will be little moisture to help the foxhound. But here also foxhounds can be used to advantage, provided that the hunt begins early enough and that care is taken that when they are brought to a line, they are not forced towards a fixed point. The danger remains, however, that they may be spoiled by the other dogs. Thus, it is imperative that when using foxhounds, other dogs should be left at home.

Where the climate permits, there is no better method than the English method of following the hounds. This method entails much less expense, for the assistance of all the farmers of the neighbourhood is not required unless they wish to take part and then this must be regarded as a sport.

All those who have knowledge of dogs know that a dog's spirit can be broken, no matter what the breed may be. A dog which has been bred and trained for a specific aim, is an extremely useful animal, but if it is managed injudiciously, it may become spoilt. Like human beings, the hounds become confused if shouted at unnecessarily or if they are forcibly stopped from doing what they consider is expected of them. It is therefore essential that there should be only one trainer and that he should have sole control over the hounds when they are following a line.

For the past few years a club owning good foxhounds has been in existence in the Somerset East district. The hounds are under the care of a Coloured man, who not only receives a good wage and rations, but also a fixed reward from each farmer on whose farm a Black-backed jackal or other vermin have been destroyed. This reward is determined by the members of the club themselves and though comparatively high, it serves as an incentive and it is almost unnecessary to add that the whole scheme is a great success.

From the most recent figures obtainable of club hunts in the Transvaal (as compiled by the Department of Fauna and Flora), it appears that during the past hunting season each club has averaged five hunts and that on an average less than two jackals were destroyed per hunt. In the Transvaal the clubs, with a few exceptions, use the encircling method of hunting. If the expenses are taken into account, it is doubtful whether this can be considered a cheap method, and in any case results such as these are no solution to the problem of the Black-backed jackal. The number of hunts will have to be increased extensively if any lasting success is to be achieved.

It is difficult to estimate which is the cheaper way of hunting with hounds—the encircling method or that as practised in England. No farmer can determine exactly what he loses by a day's absence from his farm. If an experienced hunter with trained dogs hunts for him, he knows the precise cost of the day's hunting.

The average membership of clubs in the Transvaal, according to the report previously mentioned, is about 20 members per club and from the information obtained from the secretaries of the various clubs, it would seem that the average expense per day of each member is £1, i.e., a day's hunting entails a cost of £20 for the club, without any losses on the farm, due to the farmer's absence, damage to vehicles, accidental death of a horse, etc., being taken into acccunt. From these figures it may be concluded that it costs the Transvaal farmers £10, on the average, to destroy one Black-backed jackal.

In contrast to this farmers owning their own packs of hounds, have found that their food and care, including veterinary services, amount to the most to £120 per annum. To this must be added £120 for the wages and rations of the Coloured man or Native who must care for the hounds and hunt with them. The entire maintenance thus amounts to £240 per annum.

Supposing that such a pack of dogs were owned by a club, averaging 20 members, and that each member had at least one hunt annually, then the cost would be £12 per hunt. If two jackals, on an average, were destroyed per hunt, it would mean that the cost involved for the destruction of one jackal could be estimated as £6. Naturally, though, if a club has its own pack of dogs, at least two hunts annually can be arranged for each when the encircling method is used, viz., £3 as opposed to £10. In this case the possible losses of the farmer, which may be incurred in his absence, are also eliminated, for if he does accompany the hounds, he does this for his own sport.

The most important objection to acquiring hounds at this stage is their purchase and accommodation. Good foxhounds are still difficult to procure in South Africa. The average price of a trained dog is £22. 10s. and that of young, untrained dogs is £11 each. The expense should, however, be regarded as an investment, for the value of good hounds will not easily depreciate and by the sale of puppies or young, trained hounds, the initial cost can be recovered. After this any further increase may be regarded as profit and a decrease in the cost of maintenance. If jackal hunting is ranked as a sport, higher costs will be entailed, for then it is no longer work but the sport, which counts. In this case more expense will be involved to give it a higher status. A European hunter will have to be appointed with a non-European assistant. A suitable vehicle, used only for the transport of the hounds, will have to be obtained. Larger kennels with more facilities will have to be built but anybody regularly practising this sport, will affirm that all the costs involved, are worth while.

Good foxhounds are established in South Africa and as conditions are at present, it seems as if they will contribute largely in the control of the Black-backed jackal. Hounds only, cannot eliminate the Black-backed jackal, but used in conjunction with other subsidiary means, the problem can yet be solved in the future.

USE OF RIFLES.

The use of rifles in the extermination of Black-backed jackals is limited and these are used mainly by persons placed in strategic positions when an area is combed.

These persons should bear in mind that the Black-backed jackal will flee down-wind when pursued by dogs, when they take up their positions. For reasons of safety, it is best to be armed with a shotgun, for shots have frequently to be fired in the direction of the beaters. The choice of the cartridge depends on the person handling the gun, but according to the opinions expressed by correspondents, nothing finer than number 2 cartridges should be used. If those in the advanced positions are accompanied by dogs, great care should be exercised, for many a good dog has undeservedly received a load of buckshot. On no account should shots be fired blindly only because a shrub or tuft of grass has moved.

Again for safety reasons, if only guns are used and the hunt is carried out by two people, these should be armed with rifles and for a successful hunt the rifles should not be of the lighter type, but at least a ·303 or one of equal calibre.

If the hunter goes out alone, he should have previously ascertained the beat of the Black-backed jackal and approach against the wind. Jackals which have been on the prowl during the night, return to their lairs from just before dawn till sunrise. As previously stated, the Black-backed jackal lies down on some high place from where it can see approaching danger in time. During the winter it will lie full in the morning sun and it will even change its position in accordance with the sun. During summer it will be found on the shaded side of the rise and if there is a small ravine between the ridges, it will prefer sheltering there, provided the vegetation is not too dense.

The Black-backed jackal usually sleeps from about 11 a.m. to 4 p.m. If the sun becomes too warm, it will move into the shade and perhaps go to drink water in the middle of the day. On cold days it finds a sheltered spot in the sun in which to sleep.

On cold, rainy and especially on misty days, the cold and hunger drive the Black-backed jackals out in search of food and the hunter who is prepared to venture out in such weather, has a good chance of finding his quarry.

A Black-backed jackal will never seek its shelter in the most densely vegetated part of the farm, for under such circumstances the prospects of its enemies sighting it first are too favourable. It will seek refuge in the dense undergrowth if the chase is too close, but it will not remain there.

It is not of much avail to search for the Black-backed jackal during the hours that it sleeps, for then it is too drowsy to be warned of the danger in time and unless the hunter moves directly towards it, it remains motionless and the chances that the hunter will see it, are slight. In a case like this it is advisable for the hunter to be accompanied by good dogs.

Most correspondents consider 4 p.m. the best time when using a rifle to hunt a Black-backed jackal. At this time the Black-backed jackal is alert enough to become aware of danger in time and to leave its shelter, but it is still slow in its movements and can easily be brought within shooting range. On such occasions it is advisable to go on horseback, accompanied by dogs. According to correspondents, a hunter without dogs, encountering a drowsy jackal, should remain motionless on his horse until the jackal moves forward. As it turns away the hunter should dismount and wait until the jackal halts to look back. If this does not happen, the hunter can draw the jackal's attention by a soft whistle and when it halts, it should be shot.

Only a few correspondents have stated that they hunt the Black-backed jackal by night and for this they use either a shotgun or a ·22 rifle. The Black-backed jackal's eyes appear a fiery red in the light of a lamp and it has the unusual habit of frequently turning its eyes away from the light. It can also be identified by its two upright ears. If it has been followed against the wind, it will attempt to circle back, so that it will reach a position which is down-wind. Once the hunter has given the jackal an opportunity to do this, he will never get it within shooting range. It should be determined immediately in which direction it is moving and as soon as its eyes show again, it should be fired at quickly. It should be remembered that although the jackal has moved round in a half circle, it has also moved progressively further away from the hunter. In this case the hunter must go out alone for assistants only increase the possibility of accidents and a vehicle frequently proves a hindrance. There are, however, always the inquisitive jackals which instead of moving away, approach and even come within shooting distance, but they are generally those which have not yet become addicted to sheep-killing.

One correspondent writes that he makes use of cart and horses to hunt the jackal by night. Accompanied by somebody to hold the reins, he does not take a rifle but his two trained dogs. As soon as the light catches the eyes of the Black-backed jackal, he leaves the cart and horses in the charge of the other person, while he brings his dogs to the line. Then it is merely a question of time before the dogs bring down the jackal.

Spring guns do not enjoy much support although various correspondents have achieved considerable success with these. All are agreed that this is an extremely dangerous practice. Many people have been seriously injured by these guns and in addition good farming stock and hundreds of useful little animals have been destroyed in this way.

For the setting of this gun, a gap in the fence must be selected which is not large enough to allow a sheep through as well. It is advisable to block the lower part of the gap, so that antbears will not attempt to crawl through and that the Black-backed jackal will only be able to pass through by jumping. Before setting the gun, it should first be determined definitely that Black-backed jackals make use of this gap. Passages between two large stones or bushes or between an antheap and a bush, etc., are also suitable places for setting the gun, provided these lie within the jackal's beat. All stock should be removed from this camp and the unloaded gun fastened to two pegs, which have been firmly driven into the ground about three to four yards from the gap. A piece of flat iron or wood, about 12 to 14 inches in length, is then screwed onto the butt-end of the gun, about five to six inches behind the trigger, so that it can turn freely. The lower end of this is attached to the trigger by means of a thin, but strong copper wire loop. The wire should not be fastened onto the trigger for the loop should be free to glide over the inner surface of the trigger. A long piece of strong, thin copper wire is attached to the upper end of the piece of iron or wood and the wire is then drawn to the gap, where it is threaded through the eye of an iron peg, placed on the same side as the gun, and then fastened to another peg on the other side of the gap. If a peg with a hole in it cannot be found, a piece of smooth wire can be twisted round the peg to form an eye. The wire should be set just high enough for the Black-backed jackal to push it up with its shoulders when passing through, for this prevents smaller animals from discharging the shot. There should not be too much play in the wire but on the other hand, it should also not be stretched too tightly, otherwise shrinkage, due to cold during the night, will cause the shot to be discharged. Here, as in the setting of traps, as few tracks as possible should be left and the path especially should be avoided.

When everything is in order and the mechanism has been properly tested, all tracks should be obliterated and fine, dry horse dung should be strewn about to disguise the human smell. The gun should then be loaded and walking backwards, the last tracks should be removed.

It is absolutely essential that the gun-site should be inspected regularly. but to avoid leaving human scent, it is advisable to go on horseback. A gun reeking of old oil or one which has been used frequently should not be set up, for the Black-backed jackal will become aware of the smell. It is always advisable to set a shot-gun, for if this is well aimed, it is a very merciful way of killing, although if this is not the case, the animal will be horribly mutilated. At all times, every precaution should be taken when approaching a spring gun.

Some people prefer setting the gun across the gap and for this only one peg is required, although a second peg always gives a greater measure of firmness. Others again, prefer setting the gun near carrion but in this case the objection that a sheepkiller will not be attracted by carrion, unless fenced in by jackal-proof netting, still holds.

The Black-backed jackal is also frequently led into an ambush when a small orphan lamb, tied to some object by the hindleg, is left in the veld. Usually this is done on a quiet day at about three o'clock in the afternoon. A good marksman, who will not smoke, must then conceal himself in such a way that not even the slightest breeze will betray his presence. He must select a comfortable spot, for if he moves about to change his position, the jackal will soon know of him. The jackal will be lured into approaching by the bleating of the lamb and can easily be shot.

Unfortunately, it has not yet been determined whether the Black-backed jackal can be lured by the imitated bleating of a lamb, but in North America, according to Alcorn (1), Wetmore (85) and others, the Coyote is easily deceived by the imitated calls of mice, hares and even of other Coyotes.

Correspondents advocate the founding of rifle clubs, with a view to the extermination of the Black-backed jackal. This is not only a very useful suggestion but the members of the club will also find the sport most enjoyable.

When a combined or club hunt is carried out, a few good marksmen are sent ahead to lie in wait for the jackal in these advanced positions. By firing a few strategic shots or by lighting fires in suitable spots early in the morning, Black-backed jackals can be practically forced to flee directly towards those lying in wait ahead, especially if the beaters, on foot and horseback, with the assistance of dogs, begin to exert pressure at the right time. The best time for the beaters to begin is as soon as it is light enough for the marksmen to be able to shoot. The latter should always keep sharp watch, for they will catch sight of the first jackal long before they hear the noise made by the beaters. As stated previously, it is advisable for those lying in wait to take up positions down-wind, if the beaters are accompanied by dogs. It should be borne in mind that only an excellent marksman will be able to hit a fleeing Black-backed jackal on the broadside.

Short shrift can also be made of the Black-backed jackal during droughts if the hunter lies concealed near a watering-place towards sunset. A thirsty jackal is inclined to be rash, especially as it nears the water.

To attempt to eliminate Black-backed jackals by means of rifles is a futile task, but these can be used successfully against individuals. The direction of the wind, however is a factor which must always be taken into account.

POISON

The use of poison, obtainable at present, constitutes a serious danger for those who set it out. Anyone who sets out poisoned bait, and does not find a dead jackal there on the following morning, although the bait has disappeared, should realise that he has created a great, potential danger for himself. As stated previously, bait containing strychnine, can still prove fatal to dogs and other animals after two years.

The yellow mungoose, polecats and other small, carnivorous animals can pick up the poisoned bait and succumb some distance away and if the carcasses are not removed, sheep and cattle may later eat these and die.

It frequently happens that Black-backed jackals or even other small, carnivorous animals pick up the poisoned bait, carry it for some distance and then drop it, and this may later be eaten by domesticated animals.

It is imperative that every poisoned pellet which has been distributed, should be accounted for.

The Black-backed jackal which has become addicted to sheep-killing, can no longer be regarded as a scavenger and as such, it is no longer of use. It will not feed on carrion while sheep are still available in the vicinity and it is thus useless to put poison in the carcass of the sheep, which it has killed the previous night, unless all other sheep are removed from the camp and this is fenced in with jackal-proof netting, so that it cannot find a way out. Of course, there are exceptions among the Black-backed jackals and somebody may be fortunate enough to catch the jackal without taking any of the precautions mentioned. With this investigation, it has become apparent that Black-backed jackals in various regions of South Africa, differ considerably in their habits, but it is the experience of correspondents from the established sheep districts, that the real sheepkiller among the Black-backed jackals is impartial to carrion.

The danger in the distribution of poison is usually due to the uninitiated, who wish to try their hand at this. An insufficient dose of poison will only cause the Black-backed jackal to be severely sick, but it will survive. An over-dose will also only cause severe sickness, for the jackal will rid itself of this by vomiting. In both cases a Black-backed jackal, which has experienced this, will not easily be vulnerable again to poisoned bait. What is of even greater importance is the fact that such jackals will teach their cubs to avoid poison and will even resort to biting the cubs to keep them away from the poisoned bait. Other jackals will not pick up the bait, once another has micturated onto it. Bitches, usually having a sharper sense of smell, will do everything in their power to lure the males away from the bait. Old jackals, which have learnt from early experience, carefully collect the poisoned pellets, heap them together and cover them or else dig a hole and bury the pellets, usually after first having micturated onto them.

It is interesting to note that according to Goldman (33), the Coyote is also able to rid itself of poison by vomiting.

As just mentioned, jackal bitches seldom pick up poisoned bait, presumably because they have a more keenly developed sense of perception. They also have learned to rid themselves of the poison easily by vomiting. It has occurred that hungry bitches, with a number of cubs, have picked up the poisoned bait and succumbed, but usually only the young, the stupid and famished older jackals are trapped by poison.

Many correspondents are of the opinion that even though numbers of Black-backed jackals may be trapped by poison, this will not serve to eliminate them. An important factor which should be taken into account, is the fact that even though hundreds of Black-backed jackals are destroyed by poison, those remaining do not suspect danger and do not migrate. Roberts (61) has described that if a territory has been rid of Black-backed jackals by means of poison, other Black-backed jackals have invaded these areas within a few months. It would seem as if this is a defect in the Black-backed jackal's habits of which full advantage should be taken. It may perhaps mean that the correct kind of poison, set out in the correct manner, may be the solution to the Black-backed jackal problem.

At one stage it seemed as if the deadly Prussic acid was the solution to the difficulties, but unfortunately, the manufacture of these capsules or gas pellets, as they were named by farmers, ceased during the recent war and it has not yet been resumed.

Death is almost instantaneous on the liberation of Prussic acid. When the Black-backed jackal breaks the capsule by biting it and the acid is liberated, death follows. There is no opportunity to vomit or to profit by the experience in escaping from the effects in any other way or to warn other jackals against this. Naturally, the poison is equally fatal to human beings and this may be the reason why it has been withdrawn from the trade.

Enterprising farmers even plaited these Prussic acid capsules into the throat wool of sheep and more than one jackal was killed when it caught the sheep by the throat, and equally important was the fact that the sheep was usually unscathed.

The danger of indiscriminate distribution of poison lies in the fact that not only Black-backed jackals but also the Silver fox, the yellow mungoose, polecats, hyenas, otters, badgers, wildcats, bush-pigs, vultures, crows, falcons, owls, leguans and many other and sometimes useful scavengers are destroyed. If there is nothing to remove the carrion, there will be an outbreak of blue-bottles which will create a new problem for the farmer. Rotting carcasses are a lasting danger to the farmer for his stock may feed on these, and Botulism, etc., will cause death among his stock.

There is the deplorable practice of removing all stock from a certain camp and then adding poison to the drinking-water. This method cannot be too strongly condemned for hundreds of other useful animals, such as antbears, polecats, bustards, pheasants, various kinds of buck, etc., suffer through this, while it is only the stupid among the Black-backed jackals which will be trapped by this.

As Prussic acid is not procurable at present, arsenic and strychnine are mainly used. Prussic acid capsules had the advantage that after they had been exposed in all kinds of weather for some months, they became harmless, but the other two poisons mentioned always remain fatal. One correspondent most resourcefully made use of Ptomaine poison by cutting open a tin of sardines and leaving these to rot in the sun. The sardines were later used most successfully on a drag.

Arsenic has the advantage that it is tasteless, but its action is slower than that of strychnine, with the result that the Black-backed jackal can cover miles before it succumbs. This entails a long search to obviate an even greater danger, viz., that of the poisoned carcass left lying in the veld.

Strychnine, on the contrary, acts much more speedily and the Black-backed jackal will drop from within 100 to 400 yards. When strychnine is used it is advisable to place it as near water as possible for the bitter poison causes a deep thirst and once the jackal has drunk water there is no chance of recovery. When the Black-backed jackal has picked up poison it will attempt to eject this by vomiting and like a dog, will eat grass to stimulate this process, but on perceiving water, it will struggle towards this in the hope of ridding itself of the nausea by drinking and there it will collapse.

In the preparation of the poisoned bait or pellets, as these are generally known, the farmers are extremely resourceful. Most commonly the rectum of a sheep is cut into small pieces, about an inch or two in length, and filled with the poison, usually as much as can be lifted on the tip of a blade of a pocket knife. Also used for this purpose are the following: Small pieces of tender mutton or game; liver, lungs, raw fat (especially from the tail of a fat-tailed sheep); birds such as doves, sparrows, etc., and lizards; poison is also strewn on pieces of bacon, which are rolled up and tied; a hole is pierced in the shell of a hard-boiled egg and this is loaded with poison; the occipital regions of a sheep's head is stuffed with poison; the carcasses of sheep killed by Black-backed jackals; donkeys or hares specially shot for this purpose; the after-births of sheep and cattle; embryos of any available kind as well as the entrails of slaughtered stock.

When preparing the poisoned bait, care should be taken that as little human scent as possible is left. The knife and stick which are used for putting in the poison, should be inserted in warm dung for a few minutes before use, and rubber gloves are recommended. Some singe the pellets over a open fire or dip them into boiling water. The poison, as already mentioned—as much as can be fitted onto the tip of the blade of a knife—is either inserted directly into the pellet by means of the knife and stick or else first put into a gelatine capsule or a raisin before insertion into the pellet. These are placed in a tin, removed later by means of pliers and scattered on the drag; or else the pellets are threaded onto a length of clean, smooth wire and singed, and later, by dislodging with the stick, dropped singly on the drag. When birds or lizards are used, the poison is pushed down the throat, and in the case of an embryo, an incision is made in the side into which the poison is inserted. The embryo is then wrapped in paper and partially buried next to a footpath. When hard-boiled eggs, loaded with poison, are used it is advisable to place them near a breeding-den and partially cover them with ground.

When distributing poisoned pellets, it is always advisable first to make a drag with the entrails of some animal. If the person is on foot the entrails should be dragged after him to obliterate his tracks, but if the pellets are distributed on horseback, the drag can be done first and the rider can follow, strewing the pellets. These should be left at intervals of about 100 yards each, for an over-dose of poison will stimulate vomiting and thus it is essential to leave these sufficiently far apart. The pellets should be counted carefully, so that, if they are not picked up during the night, all can be recovered the following morning. These should be set out in the late afternoon and the results checked early the following morning. All the remaining pellets and the carcasses of the dead jackals should be removed. The former can be singed and set out again.

It is advisable to bury the entrails used as a drag, but there are old, cunning rogues among the Black-backed jackals, who will pass by the pellets and dig out the entrails. For this reason the entrails should be well strewn with poison and punctured with a stick, until they are a pulpy mess, before being partially buried. The greater the mess, the better the chances that the human scent will be disguised and that the Black-backed jackal will devour this. It has also been found that it sometimes helps to partially cover the poisoned pellets as if dogs had buried them there and wily, old jackals have been deceived in this way.

During the lambing season, after-births are excellent for concealing the poison. The after-births of cattle are also commonly used. All sheep and cattle should be removed from where these have been set. It is maintained that farmers who do not remove the after-births of sheep promptly, are themselves responsible for the fact that Black-backed jackals on their farms become addicted to sheepkilling. If, therefore, these are not used as poisoned bait, they should be carefully collected and urbnt.

As has repeatedly been stated, persons setting out poison, should bear in mind that when dealing with a sheepkilling Black-backed jackal this will be in vain, while there are still other sheep available. The use of poison is also an extremely dangerous practice which can cause the farmer heavy losses, not only among his stock but also in the destruction of useful animals.

The use of poison in the control of the Coyote, etc., in North America is advocated by well-known biologists such as Goldman (33) and

Henderson (39), but others, e.g., Hall (37) oppose this practice, mainly because so many other useful animals and especially fur-bearing animals, are destroyed in this way. Dixon (21) is of the opinion that traps are preferable to the use of poison.

The method most commonly used in North America is termed " poison stations " and the procedure is as follows: A large piece of meat, free of poison, is left in a suitable spot, to lure the animals and small pieces of poisoned bait are scattered round about this. It is maintained that this method is practised successfully by trained personnel.

The successful use of poison in South Africa depends upon the following:—

(1) How well the human scent is disguised;
(2) whether the correct dose of poison is used, i.e., not an over-dose or too little;
(3) whether the drag and the distribution of the poisoned pellets is carried out correctly;
(4) the type of poison used;
(5) the presence or absence of water; and
(6) whether other food besides the poisoned bait is available for the Black-backed jackal.

OTHER METHODS OF CONTROL

The use of kraals is a good method for checking Black-backed jackal predation during the night, but it is not a solution to the problem. If the Black-backed jackal is hungry, it will be bold enough to penetrate the kraal or else it will make its kill in broad daylight, in spite of the presence of shepherds. It is amazing how bold a famished Black-backed jackal can become.

A drawback to the kraaling system is that sheep destroy much more veld by trampling than by short-cropping, and sheep brought to the kraals every evening soon wear paths in the veld. The manure is deposited in the kraal instead of on the veld, and, in addition, the farmer wrongfully sells the manure from the kraal, instead of taking the trouble to remove this for distribution on the veld. This habit of impoverishing the veld has possibly caused the farmers much greater loss than that caused by Black-backed jackals.

A sheepfarmer, obliged by circumstances to make use of kraals, should make a thorough study of soil erosion on his farm and combat this as much as possible. One way of doing this is by having more than one kraal so that the sheep are not taken to the same kraal every evening. Precautions should be taken against impoverishing the veld, and manure from the kraals should be distributed there regularly.

Sheep are not safe in kraals the walls of which are lower than four feet in height for they will jump these, when aware of the presence of the Black-backed jackal, and it will make its kill among the bewildered sheep outside the kraal.

Kraals built of stones or bricks are preferable to those fenced in with wire, for the latter will not keep out the fence-climber among the Black-backed jackals. Kraals constructed with thorn-tree branches must be well made to prevent the entry of the jackal.

It has been recommended that a dog should be trained from puppyhood to kennel in the kraal with the sheep at night. Border Collies are generally used for this purpose and although this is an excellent preventative measure, it is not a solution to the problem.

Wool-farmers disapprove of kraals, for not only is the wool fouled by the manure in the kraal but the wool is also of inferior quality and less in quantity, as the energy expended in the greater activity is diverted from the production of wool.

Only a few correspondents advocated the bounty system as a measure for the control of Black-backed jackals. There have been many arguments about the pros and cons of this system, but as Nel (54) points out, it is a system, which has failed in most countries. In North America the system is regarded as outworn and is still only in existence in certain states for political reasons. Eminent biologists, e.g., Wing (86), regard the system as a source of fraudulent practices.

The Transvaal Provincial Council has taken the lead and abolished the bounty system and it is to be hoped that the other provinces will follow suit. In South Africa there is probably large-scale smuggling of jackal skins and tails to the provinces which pay the highest bounties.

To pay bounty sufficiently high to serve as an incentive for young men to become professional jackal-hunters is not feasible. The only reward paid should be that given by the farmer to the jackal-hunter in service of his club, as a bonus for jackals killed on his farm, as is the rule in some progressive clubs.

The idea of a few individuals that the extermination of the Black-backed jackal is the task of the Government or Provincial Administrations, is erroneous. Equally, then, the fruit-farmer may expect protection from the same sources against the pests in his orchards. As stated explicitly by Mr. T. J. Steyn, Conservator of Fauna and Flora, to the representatives of the Wool Growers Congress, such expectations must not be entertained. The Transvaal Ordnance makes provision for research concerning the Black-backed jackal, for the breeding of good foxhounds and for assistance to clubs, but this does not imply that the farmer can expect that the Black-backed jackal will be destroyed for him.

One of the most important aspects in the extermination of the Black-backed jackal, which is frequently neglected and which may be the solution to the problem, is the destruction of the jackal cubs, while they are still in the earths.

No sheep-farmer, who knows of a breeding-den with cubs, will neglect the clearing-out of this, but the breeding-dens are seldom if ever specifically and regularly raided by the clubs. It is imperative that this should be done and that the hunt on the adult jackals should be carried on at the same time without any relaxing. It is useless to concentrate entirely on the extermination of the cubs for a few months, while simultaneously allowing the adults to go free.

A warning should be given here that every burrow should first be thoroughly investigated to determine whether or not it houses Black-backed jackal cubs. If the burrows are summarily blocked or gassed, hundreds of useful, little animals will be destroyed as well. One correspondent, who conducted such a campaign on his farm, found to his consternation, that when all the Antbears and Aardwolves on his farm had been destroyed, the ants simply stripped his veld and that due to the absence of the usual scavengers such as Silver foxes, Polecats, etc., Blue-bottles plagued his sheep. This has probably been the experience of more than one farmer and others should be warned in time.

Every farmer knows the locality on his farm of the burrows in which the Black-backed jackals breed. There are various signs, previously stated, from which he may deduce whether or not the earths are inhabited by cubs. To repeat briefly: the bitch usually remains in the burrow with the cubs during the first three days, but only during the day for the next ten days. After this period, she and the male stay in the vicinity of the den during the day until the cubs are strong enough to live on the open veld. From the fourteenth day, the cubs, if need be, are able to live outside the burrow and it is advisable that the burrow should be cleared before this happens.

When the burrows on the farm are investigated, the person doing this, should have the necessary equipment with him for fetching the cubs out of the burrows and for killing them, otherwise the adults will have removed them within an hour of the discovery of the earth.

When dealing with antbear earths, it is almost impossible to dig out the cubs and in this case trained dogs, especially fox terriers are a great help. Ordinary curs, which have been trained for this purpose, are equally useful. If dogs are not available, the use of gas is the only other means and the cheapest of these is carbon monoxide, i.e., the gas given off by the exhaust of a motor car or lorry. By attaching a length of piping (garden hose will serve as well) to the exhaust and inserting the other end of this well into the burrow and further blocking the entrance to the burrow, an unlimited amount of gas can be introduced into the earth, when the engine of the motor is started. The production of carbon monoxide is speeded up if the choke is pulled out slightly, but not to such an extent that the engine stalls, and the engine should not run too fast. Naturally, care should be taken that all other exits are well blocked.

A long piece of barbed wire, bent double and pushed down into the burrow with a rotating movement, will become entangled in the woolly coats of the cubs, so that they can be dragged out unless there is a passage or hollow in the earth in which they can shelter to evade the wire.

The appetite of young hungry bitches may make them vulnerable to poisoned bait set near the breeding-den and the cubs will die of hunger, unless they are able to eat the food provided for them by the male jackal. If the bitch vomits the poisoned bait near the cubs, it may happen that they will feed on this and die.

Lying in wait near the burrows with a rifle, which, however, takes up a good deal of time, has already been discussed.

Digging out jackal cubs entails strenuous labour, but much of this can be saved if a long reed is inserted into the burrow to determine where the first turning lies. If the reed is then placed in the same direction above ground and the digging begun where the point of the reed indicates the turning, much work can be eliminated. The drawback here is that the cross-passages will be passed over, unless the entire length of the tunnel, up to where the reed extends, can be seen.

It is essential that the farmer should know exactly when the Black-backed jackals in his neighbourhood breed. In South Africa the breeding-season most commonly lasts from August to October, but this varies in different regions of the country and there are records of this being as early as April or as late as February.

The time-honoured objection that Black-backed jackals breed on a neighbour's farm and make their kills on that of another farmer, has already been discussed. The one who suffers the loss must undertake the extermination of the cubs in the burrows, with or without the assistance of his neighbour. In Transvaal the 1949 Ordinance for the Extermination of Vermin, compels the neighbour to allow the club to hunt on his farm and if he refuses assistance, he may be forced to compensate for the work done for him.

Much progress could be made if the various clubs in the four provinces established a Provincial Board of Control. While various clubs, even those in the same district, work independently of one another, no uniformity can be attained in such an important aspect as an intensive campaign against the cubs in the burrows. In the Transvaal there already is a Federal Association in existence and it is imperative that all clubs in this province should become members of this. Later an Association for the Union will become essential, but this will only be possible if each province has an established Federal Association.

SUMMARY

The most important findings of this investigation may be summed up as follows:—

(1) The Black-backed jackal was not always addicted to sheep killing, but acquired this habit when its natural food disappeared from the veld or became insufficient.

(2) Inadequate methods of destruction have eliminated only the weaklings among the Black-backed jackals and promoted the breeding of a super-jackal race.

(3) The sheepkiller among the Black-backed jackals will never again perform a useful role in nature and must therefore be destroyed.

(4) In its original state the Black-backed jackal played a useful role in nature by its removal of carrion and in the control of harmful veld animals such as rockrabbits, rats, mice and meercats.

(5) If total extermination of the Black-backed jackals should be decided upon, provision must be made for the absolute protection of the useful jackals and only those among them which have learnt to pry on sheep and lambs, should be destroyed.

(6) As a precaution that useful jackals are not forced to prey on sheep, all types of small game as well as birds should be protected on farms. If these no longer frequent the farm, they should be introduced artificially. In the latter case a biologist should be consulted so that alien animals are not introduced, which may later become a plague.

(7) The protection must be managed by the farmer himself and if partridges, for example, multiply too rapidly, the farmer must keep the numbers in check. The establishment of an artificial balance must be controlled judiciously by the farmer.

(8) No direct Governmental or Provincial assistance must be expected. The elimination of the Black-backed jackal must be undertaken by the farmers. Subsidies for the control, from either Governmental or Provincial sources are desirable, but the old, bounty system is outworn and offers opportunities for dishonesty.

(9) Vermin Clubs are an excellent means at the disposal of the farmer for tackling the problem, but co-operation among the members is essential. It is necessary that the various clubs in each province should have a Federal Association for the co-ordination of the campaign. Eventually a Union Association will be essential for uniform ordinances or laws can only follow when this has been established. The terms of the ordinances or laws should be such that it will be impossible for a farmer in an area where these clubs are in existence, not to give his full support.

(10) This investigation has clearly shown that only one method of control or destruction is not sufficient to solve the problem, but that two or more methods should be applied simultaneously, whatever the methods used, these should be carried out relentlessly.

RECOMMENDATIONS

1. *Wire-fencing.*—Wherever Black-backed jackals have been combated successfully, wire-fencing has played an important role. Jackal-proof netting is preferable to any other, and if this receives regular attention, it can be used in sandy areas equally successfully. If the cost entailed in erecting such fences is beyond the means of the farmer, well-kept, closely stranded fences of ordinary barbed wire or even smooth wire will serve the purpose equally well. Where public roads cross the farm, these should be fenced off, for gates are not satisfactory and grids are no barrier to the Black-backed jackal. Wire fences do not keep out the fence-climbers among the Black-backed jackals, unless these are provided with verandahs, but fortunately, only a few jackals learn to climb fences.

2. *Traps.*—The art of setting traps can only be attained by practice. These can be used successfully in fenced-in areas from which the stock can be removed. The best sites for setting the traps are near carrion, micturating-posts or in footpaths. In camps frequented by game which cannot be driven out, artificial scent-posts should be established. Traps should be attached to heavy objects, so that the jackal will be able to drag the trap, otherwise it will twist off its leg and escape.

3. *Foxhounds.*—The use of well-bred and well-trained foxhounds, adapted to South African conditions and used in conjunction with well-kept jackal-proof fencing, is the only method which at this stage can be freely recommended as a good method of destruction. Foxhounds have not yet received a fair test in South Africa, since not always the best hounds have been imported and they have so frequently been put to the wrong use. The clubs which own good hounds and have used them correctly, have eliminated the Black-backed jackal in their surroundings. One of the first essentials, then, is that good foxhounds should be bred in such numbers that their purchase by the clubs should not be a difficulty.

4. *Rifles.*—The extermination of the Black-backed jackal by means of rifles is almost impossible, but rifles can be used successfully against individuals. Hunting by night has so few advantages that it must be regarded as undesirable.

5. *Poison.*—The fact that when poison is set out and even large numbers of Black-backed jackals trapped, without suspicion being roused among their fellows, so that they migrate, is a defect in the Black-backed jackal which should be exploitable. Unfortunately, the types of poison available at present, do not appear to hold the key to the solution. Because poison

is a constant danger to all scavengers and carnivorous animals, and especially to good hunting dogs, its use cannot be recommended at this stage. According to the evidence of correspondents, the Black-backed jackal will never be exterminated by means of poison.

6. *Other Methods of Destruction.*—(*a*) *Kraals.*—These cannot be considered as a means of destruction, but are of use in limiting the losses caused by Black-backed jackals. Kraals can only be recommended as a preventative measure, but the damage done to the wool as well as to the veld, is greater than the losses to sheep out in the open. If kraals are used, there should be a few in different localities on the farm to limit unnecessary eroding of the veld.

(*b*) *Sheep-dogs.*—These, too, are only a preventative measure and not a solution to the problem. Such dogs, especially if the Border Collies are used, should be reared with the sheep from puppyhood and kennel with them in the kraal at night. The Kelpie can also be successfully used for this purpose.

(*c*) *Shepherds.*—According to many correspondents these are so untrustworthy today that they cannot even be regarded as a measure of control. They can also only be of use during the day and are not a solution to the problem.

(*d*) *The Bounty System.*—This in its present form is a farce. It offers opportunities for dishonesty and does not serve as the incentive which is its actual purpose. The sooner the other provinces follow the Transvaal's lead in abolishing the system, the sooner will there be sufficient funds for tackling the problem on the proper scale.

(*e*) *The Destruction of Cubs in the Breeding-dens.*—This, today, is the second most important factor of control, if in fact, it is not the solution to the problem, but it should be done without neglecting the campaign against the adult jackals and with the necessary precautions not to destroy other, useful, little animals in the process. Dogs and poison gas can be used for this purpose. It is essential for every farmer to know when and where Black-backed jackals breed on his farm and it is his duty to see that the burrows are cleared with or without the assistance of his club.

(*f*) *Clubs and Associations.*—Full co-operation amongst members of these is essential in the campaign against the Black-backed jackal. It is equally important that this should be carried out relentlessly. The duties may often be exacting, but devotion to these will prove the farmer's determination to exterminate the Black-backed jackal. It is imperative that the clubs should be subsidised either by the state or the Provincial Administrations or else receive some form of financial aid, for the speedy solution of this problem is in the interests of the whole population.

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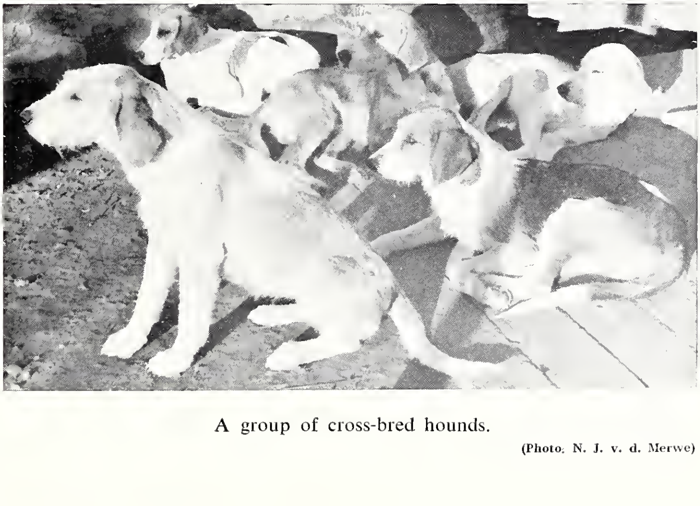
Lurcher Puppies.

(Photo. N. J. v. d. Merwe)



A group of cross-bred hounds.

(Photo. N. J. v. d. Merwe)

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JAKKALSHONDE IN SUID-AFRIKA

deur

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FOXHOUNDS IN SOUTH AFRICA

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S. A. Lombard

Opgedra aan
DIE STIGTER VAN DIE AFDELING
NATUURBEWARING,
MNR. S. A. LOMBARD,
WAT DIE TUIG AS PROVINSIALE
SEKRETARIS OP 15 NOVEMBER
1955 NEERLÊ

Dedicated to
THE FOUNDER OF THE NATURE
CONSERVATION SECTION,
MR. S. A. LOMBARD,
WHO RETIRES FROM HIS DUTIES
AS PROVINCIAL SECRETARY ON
THE 15TH OF NOVEMBER, 1955

VOORWOORD

IN 1820 is die „Cape Hunt & Polo Club" in Kaapstad gestig met die doel om die ou kuns van vosjag in hierdie land te beoefen, maar ongelukkig het dit nooit as sportsoort ingeslaan nie en na die totstandkoming van die „ Rand Hunt Club ", Johannesburg, in 1886, is daar verder geen soortgelyke klub gestig nie. (Vergl. „Baily's Hunting Dictionary".)

In teenstelling hiermee het die gebruik van jaghonde egter in die stryd teen die jakkals en ander ongedierte, steeds meer opgang gemaak en vandag word dit as die belangrikste bestrydingsmiddel beskou.

Ongelukkig bestaan daar nog 'n groot tekort aan opgeleide jagmeesters en omdat dit so belangrik is dat jakkalshonde reg gebruik word, is 'n handleiding van hierdie aard seker nie oorbodig nie. Dit is saamgestel met die vooropgestelde doel om die opleiding van leerlingjagters te vergemaklik.

Graag wil ek dan hier die twee medewerkers, dr. F. J. Veldman en mnr. D. E. Compion besonder bedank vir hulle bydraes, asook vir my vrou en mnr. T. B. Verschuur vir die vertaalwerk en mev. T. Campbell vir die buiteblad-tekening.

N. J. VAN DER MERWE,
Redakteur.

S.A. Lombard-Natuurreservaat,
Bloemhof,
Transvaal, S.A.
19 November 1954.

FOREWORD

IN 1820 the Cape Hunt & Polo Club was founded in Cape Town with the object of introducing the age old art of venery into this country, but unfortunately it was never generally accepted as a sport, and after the establishment of the Rand Hunt Club in Johannesburg in 1886, no further club of this type was founded in South Africa. (Cf. Baily's Hunting Dictionary.)

In contrast with this, however, the use of hounds in combating jackals and other vermin, became increasingly more popular, and today this method is considered to be the most effective.

Unfortunately there still exists a great shortage in qualified huntsmen, and since it is very important that hounds should be handled in the correct way, a manual of this type should not be superfluous. It was compiled with the specific object of facilitating the training of prospective huntsmen.

Finally I wish to record with gratitude my indebtedness to the co-authors, Dr. F. J. Veldman and Mr. D. E. Compion, as well as to my wife and Mr. T. B. Verschuur for the translations, and Mrs. T. Campbell for the cover design.

N. J. VAN DER MERWE,

Editor.

S.A. Lombard Nature Reserve,
Bloemhof,
Transvaal, S.A.
19th November, 1954.

KEUSE EN TELING VAN JAKKALSHONDE VIR SUID-AFRIKAANSE TOESTANDE

BY die afrigting van jakkalshonde word gewoonlik aangeneem dat daar nie soiets as 'n slegte hond bestaan nie, maar dat daar wel swak afrigters is. Ongelukkig is hierdie bewering nie altyd juis nie want daar bestaan uitsonderings en daar is, selfs onder die besgeteeldes, honde wat nooit vir jakkalsjag sal deug nie.

Voor enigiemand hom as teler en afrigter van jakkalshonde wil bekwaam, is dit vir hom noodsaaklik om iets te weet van die hond waarmee hy gaan werk: daar bestaan verskillende soorte jaghonde („ hounds "), maar almal is nie geskik om jakkalse mee te jag nie.

In Engeland, waar die jakkalshond („ fox hound ") sy oorsprong het, is in die vroegste tye van verskillende soorte jaghonde gebruik gemaak vir die teel van 'n hond wat uitsluitlik vir die vang van die vos gebruik kon word. Tegelykertyd is ook ander tipes jaghonde vir spesifieke doeleindes geteel. So bv. is die Herthond („ stag hound "), Otterhond, die Harrier en die Beagle ontwikkel.

Ons vind dat die Beagle en Harrier dikwels in Suid-Afrika met jakkalshonde verwar word en ook dikwels vir jakkalsjag gebruik word. Hierdie honde is egter geteel om hase te vang en hulle word in Engeland slegs met hoë uitsondering vir die vang van die vos gebruik. Tussen die vos en die jakkals is daar 'n geweldige verskil en dit verklaar die teleurstelling van baie jagters.

Die verskil tussen die jakkalshond, die Harrier en die Beagle lê daarin dat hul grootte in dieselfde volgorde afneem. Daar is ook nog die Basset wat nog heelwat korter op die been as die Beagle is en wat die voorkoms van 'n Dachshund en die kleure van 'n jakkalshond het. Wat belangrik is, is om te onthou dat hierdie vier soorte honde deur sorgvuldige seleksie uit gemeenskaplike stamouers geteel is. Ook is dit noodsaaklik om te besef dat daar in die verskillende dele van die Britse Eilande verskillende tipes jakkalshonde geteel is en ook dat nog verdere tipes in Frankryk en in die Verenigde State van Amerika ontwikkel is.

Wat algemeen as jakkalshonde erken word, is dié waarvan die reuns by die skouer gewoonlik van 22 tot 24 duim meet, met die tewe gemiddeld 2 duim laer op die been. Hulle is gewoonlik bont honde, oorwegend wit met bruin en swart vlekke. Ook is hulle gewoonlik gladdehaar honde, maar daar is ook 'n wolhaartipe.

Daar is drie tipes jakkalshonde wat in Suid-Afrika gebruik word om spanne vir die jag van die rooijakkals te teel. Elkeen het sy besondere eienskappe maar, om te herhaal, dit is nie uitbastering nie: dit is gewone kruising van verskillende tipes van een en dieselfde soort jaghond.

Die eerste tipe is die standaard „ fox hound ", wat hoofsaaklik in Engeland se graafskappe ontwikkel is: 'n stewiggeboude hond met 'n verbasende uithouvermoë, 'n goeie neus en stem, maar veral bekend vir sy vermoë om tussen spore van verskillende diere te kan onderskei. Die nadeel van hom as jakkalsvanger in Suid-Afrika is sy gewig en ook tel sy pote op ons dorre bodem teen hom.

SELECTION AND BREEDING OF FOXHOUNDS FOR SOUTH AFRICAN CONDITIONS

IN the training of Foxhounds it is usually assumed that there is no such thing as a bad hound, but that the hound has been poorly trained. This assumption is, unfortunately, not always correct because there are exceptions and there are, even among the best bred of hounds, those which will be useless for jackal hunting.

Before anyone can qualify as a breeder and trainer of Foxhounds, it is necessary that he should know something of the hound with which he is going to work: there are several kinds of hounds but not all are suitable for jackal hunting.

In England, where the Foxhound has its origin, use has been made from the earliest times of different kinds of hounds for the breeding of one which could be used exclusively for hunting the fox. Simultaneously other types of hounds were bred for specific purposes. So, for example, the Stag hound, the Otter hound, the Harrier and the Beagle were evolved

In South Africa the Beagle and the Harrier are frequently confused with Foxhounds and often used for jackal hunting. These hounds, however, are bred for hunting hares and, in England, are rarely used for fox hunting. There is, however, a vast difference between the fox and the jackal—which explains the disappointment of many huntsmen.

The difference between the Foxhound, the Harrier and the Beagle lies in the fact that their size diminishes in the same order. Then there is also the Basset which is shorter in the leg than the Beagle and has the appearance of a Dachshund and the colouring of a Foxhound. It should be borne in mind that these four types of hounds were bred by meticulous selection from common ancestors. It is also essential to realise that in different parts of the British Isles, different types of Foxhounds have been bred and that yet other types have been evolved in France and in the United States of America.

The hounds generally recognised as Foxhounds, are those where the male usually stands from 22 to 24 inches at the shoulder, while the bitches average 2 inches less in the leg. They are generally predominately white with tan and black patches. Generally too, they are smooth-haired hounds with the exception of one wire-haired type.

In South Africa three types of Foxhounds are used for breeding jackal-hunting packs. Each type has its own peculiar characteristics but to repeat, this is not hybridization; it is regular crossing of different types of one and the same kind of hound.

The first type is the standard Foxhound, which was evolved chiefly in the counties of England: a sturdily built hound with astonishing stamina, a good nose and voice, and one specially renowned for its ability to differentiate between the scents of various animals. The weaknesses of this hound as a jackal-hunter in South Africa are its weight and its paws, the latter being unsuited to arid South African conditions.

RIFLEMAN.

Engelse jakkalshond. Foxhound.

Die tweede tipe is die Walliese jakkalshond: 'n wolhaartipe, betreklik groot van gestalte, met uitstekende pote vir ons omstandighede. Hy het 'n pragtige stem en goeie neus, maar het ook die een groot fout dat hy nie besonder tussen spore kan onderskei nie. Dit gebeur dan dat hulle enigiets kan jag, selfs plaasdiere. As 'n suiwergeteelde tipe is sy hare ook te dig vir ons klimaat, maar met kruising word dit baie dunner.

Die derde tipe is die Fell, 'n jakkalshond wat in die noordelike grensgebiede van Engeland, die ,, Fells ", ontwikkel is. Hierdie tipe is seker die geskikste vir Suid-Afrika. Al wat teen die Fell gesê kan word, is dat sy stem swak ontwikkel is. Daar bestaan die mening in Suid-Afrika dat dit eerder 'n bate as 'n fout is, maar die oorgrote meerderheid van jagters meen tog dat dit noodsaaklik is dat 'n jakkalshond moet blaf sodra hy die spoor gevat het. Wat die Fell dan verder betref: hy het 'n uitstekende neus, baie goeie pote, goeie onderskeidingsvermoë en is die intelligentste van alle jakkalshonde. Hy het 'n gerieflike grootte, maar is tog lig gebou en baie vinnig.

Wanneer ons in Suid-Afrika 'n jakkalshond teel, wil ons 'n hond hê wat die rooijakkals so gou moontlik sal opspoor, inhardloop en vernietig. In Engeland is die doel ook om uiteindelik die vos te vang, maar die pret is eintlik om eers etlike myle agter die honde en voortvlugtende vos aan te jaag. Daar is dit dus 'n sportsoort, terwyl dit hier die uitroeiing van 'n ongedierte is.

By die teling van jakkalshonde vir ons omstandighede soek ons dus eerstens 'n hond met 'n goeie neus, maar ook een wat 'n spoor kan hou en nie elke vars spoor wat oor die oorspronklike een gaan, sal vat nie.

The second type is the Welsh hound; a wire-haired type relatively large in stature, with excellent feet for South African conditions. It has a good voice and a keen nose but its one serious fault is an inclination to riot. It will thus hunt anything, even domesticated animals. As a pure-bred type, its coat is also too thick for the South African climate, but with cross-breeding the hair becomes much sparser.

The third type is the Fell, a hound bred in the northern counties of England—the Fells. This type is certainly the most suited to South Africa. Its only disadvantage is its poor voice. According to a few South African huntsmen, this weakness is more of an advantage than a fault but the great majority consider it essential that a Foxhound should give tongue immediately on uncovering a line. Further with regard to the Fell; it has an excellent nose, very good feet, sound differentiation of scents and is the most intelligent of all hounds. It is of convenient size, but for all that is lightly built and very fast.

For South African conditions, the desired Foxhound must be one that will uncover the line of the Black-backed jackal speedily, overtake and kill its quarry as soon as possible. In England the objective is also finally to catch the fox, but the sport actually lies in first following the hounds and fleeing fox for several miles. There it is a form of sport while in South Africa it is the extermination of vermin.

In the breeding of Foxhounds to suit South African conditions, the first attribute to be considered, should be a good nose, yet the hound must also drive strongly on the line with no tendency to riot. The most commendable type therefore is the standard Foxhound. About a century ago Foxhounds were crossed with Bloodhounds with the object of improving the nose. A Foxhound must follow the line by means of its nose and not rely on its eyesight when it nears the jackal. This is something to which the trainer must pay strict attention, because a jackal may easily change direction

FOREMAN.

Welsh hound. Walliese jakkalshond.

Die tipe waarop ons dus aangewys word, is die Engelse tipe. Om en by 'n honderd jaar gelede is jakkalshonde met bloedhonde gekruis om die neus te verbeter. 'n Jakkalshond moet die spoor met sy neus volg en nie, wanneer hy naby die jakkals kom, op sy oë begin staatmaak nie. Dit is iets waarop die afrigter streng moet let, want 'n jakkals kan maklik 'n draai hardloop en in 'n gat verdwyn sonder dat die honde hom sien, met die gevolg dat hulle hom verloor. As hulle op die reuk werk, sal hulle wel ook die ompad hardloop, maar uiteindelik sal hulle die jakkals tog inhaal.

'n Belangrike faktor wat hier net voorlopig genoem moet word, is die rol wat waterdamp in die behoud van die jakkalsspoor speel. Selfs in Engeland, met sy vogtige klimaat, moet daarmee rekening gehou word. Dit kan dus nie verwag word dat 'n jakkalshond op 'n dorre dag met sy neus sal kan werk nie. Dit moet egter onthou word dat slegs honde met baie goedontwikkelde ruikvermoë gebruik moet word vir teling vir Suid-Afrikaanse omstandighede.

Die vermoë om tussen verskillende spore te kan onderskei, is ingebore, maar dit is 'n eienskap wat deur die regte afrigting van kleins af ontwikkel moet word. Ook hier moet egter gesorg word dat die eienskap by albei teelouers aanwesig is, om sukses te verwag. Die intelligensie van die Fell laat hom juis in hierdie verband geld.

Dit help egter nie veel om 'n hond met 'n uitstaande neus te hê wat te stadig is om met 'n rooijakkals af te reken nie. Die Engelse tipe is betreklik stadig, maar die Walliese- en Fell-tipes kan die nodige spoed met kruisteling gee. Die resultaat is gewoonlik 'n hond wat enige rooijakkals sal kan inhaal. Dit is interessant om te weet dat die jakkalshond se spoed ook vermeerder is deur windhondbloed in te teel. Ook moet besef word dat die rooijakkals, wat van kleinsaf voortvlugtend is, natuurlik oor 'n geweldige uithoudingsvermoë beskik, maar die Engelse tipe besit daardie eienskap in 'n besondere mate en dit word ook met kruisteling behou. Dit is verbasend hoe gou 'n span moeg en pootseer jakkalshonde kan herstel as hulle 'n spoor kry. Die kenmerk om aan te hou tot hulle die jakkals vankant het, is dus 'n groot bate van die jakkalshond.

Die poot van die jakkalshond is iets wat in Suid-Afrika sorgvuldige aandag moet geniet, want 'n pootseer hond op ons onherbergsame oppervlakte is iets wat die geduld van die jagter tot die uiterste beproef. Daar word hoofsaaklik tussen twee soorte pote onderskei: eerstens die katagtige poot, wat 'n netjiese ronde poot is. Die gewig van die dier rus nie alleen op die hand- en voetbeentjies nie, maar tot 'n groot mate op die tone self, soveel so dat die polsgewrigte van die voorbene selfs vorentoe oorbuig. Hierdie tipe poot is vandag in Engeland baie populêr en word verwag by alle belangrike tentoonstellings waar jakkalshonde vertoon word. Vir ons omstandighede is dié soort poot egter fataal. Ons grondoppervlakte is te ongelyk, te skurf, en hard met die gevolg dat die klein pootoppervlakte wat aan die grond raak, baie gou deurslyt.

Die tweede tipe poot staan bekend as die haaspoot. Hier is die hand- en voetbeentjies skuins op die as van die been, ook die toonkootjies lê met 'n hoek teenoor die hand- en voetbeentjies. 'n Betreklik groot oppervlakte van die toonkussings is dus aan die grond blootgestel en daar is 'n aansienlike mate van veerkrag in die poot self, iets wat 'n belangrike faktor op 'n ongelyke bodem is.

and disappear down a burrow without being seen by the hounds, with the result that they lose him. If the hounds keep to the line, they will also follow the deviation, but in spite of the delay, finally catch up with the jackal.

An important factor which should be mentioned here is the rôle that water vapour plays in retaining the jackal's scent. Even in England with its moist climate, this factor has to be taken into account. It can, therefore, not be expected that a Foxhound should work by its nose on an arid day. It must be remembered, however, that only those hounds with a well-developed sense of smell must be used for breeding for South African conditions.

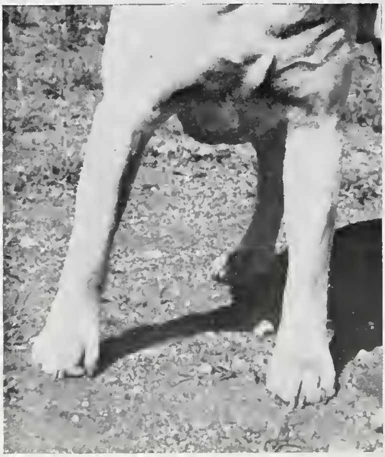
CAPTAIN.

Fell hound. Fell jakkalshond.

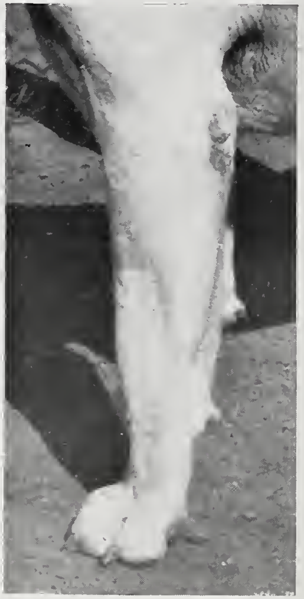
The ability to differentiate between various lines is inherent, yet it is a characteristic which should be developed right from the outset by correct training. Here also, care must be taken that this propensity is present in both parents in order to achieve success. The intelligence of the Fell is of great importance in this respect.

It is, however, not much use having a hound with an excellent nose if it is too slow to deal successfully with the Black-backed jackal. The standard Foxhound is moderately slow, but with cross-breeding the Welsh and Fell types will supply the necessary speed. The result generally is a hound which can overtake any Black-backed jackal. Of interest is also that the speed of the Foxhound has been improved by the introduction of Greyhound blood. It should also be realised that the Black-backed jackal which is a fugitive from infancy, naturally has excellent stamina, but the standard type of Foxhound also possesses this characteristic to a marked degree, which is maintained by cross-breeding. It is astonishing how quickly a tired and footsore pack of Foxhounds will revive if they uncover a line. The characteristic of pursuing the jackal until it has been destroyed is thus a great asset of the Foxhound.

Beide die Walliese en Fell-tipes het haaspote en dit is dus noodsaaklik om van hulle in te teel om 'n span honde met goeie pote vir ons omstandighede te kry. Daar moet egter op gelet word dat hierdie soort poot in sy uiterste mate in die windhond ontwikkel is. Dit is 'n rede vir die geweldige spoed van hierdie soort hond, maar ongelukkig beteken dit ook 'n mate van swakheid in die gewrig. Gevolglik kan die windhond nie vir lang afstande hardloop sonder dat dié swakheid hom laat geld nie. Daar moet dus na 'n gesonde middeweg gestreef word en dit is noodsaaklik om teeldiere in die veld uit te soek, waar hulle gedurig onder observasie van die jagter is.



A.
'n Tipiese katpoot.



B.
A typical cat foot.

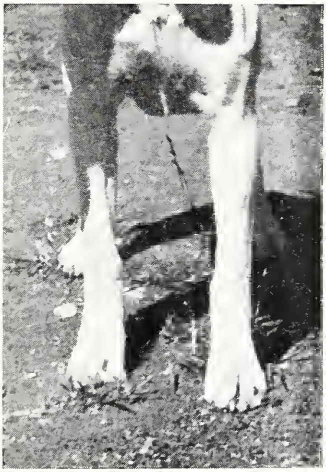
'n Goeie stem en veral die regte gebruik daarvan, is 'n noodsaaklike eienskap van 'n jakkalshond. 'n Mooi stem kan ingeteel word, maar om dit reg te gebruik, moet aangeleer word. Met geduld kan 'n jakkalshond geleer word om slegs te begin blaf wanneer hy 'n jakkalsspoor het. Daar is egter sekere honde wat geneig is om te „ babbel ", d.w.s. uit pure opgewondenheid sommer vir nul en geen rede aan die blaf te gaan. Vir sulke lawaaimakers is daar geen genade nie en hulle moet dit dadelik afleer of so nie vernietig word. In elk geval moet so 'n hond nooit vir teeldoeleindes gebruik word nie. 'n Nuttelose gekef en 'n lawaai is definitief nie bevorderlik vir jakkalsjag nie.

Daar word, soos reeds hierbo genoem, die opinie gelug dat 'n stil hond baie beter kans staan om 'n rooijakkals te vang omdat die geblaf sodra die spoor gevat word, die jakkals vroegtydig waarsku en hom kans gee om hom uit die voete te maak. Dit is waar dat die jakkals dan vroegtydig padgee, maar dit is ook gevind dat die knaende geblaf die jakkals aderhand so paniekbevange maak dat hy tog uiteindelik makliker tot

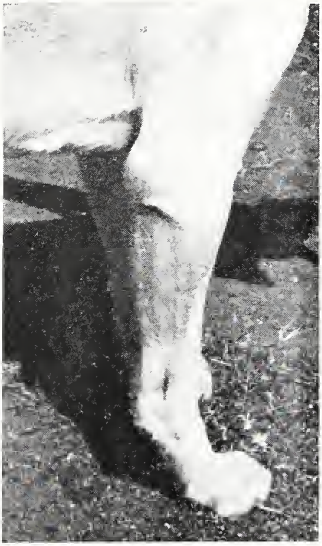
In South Africa the foot of the Foxhound is a point which must be afforded the most careful attention, as a footsore hound on this inhospitable surface, is one which tries the patience of the huntsman to the utmost. Only two types of feet need be considered: firstly, the cat-like foot, which is a neatly rounded paw. The weight of the animal rests not only on the carpal and tarsal bones, but to a great extent on the actual digits, so much so that the pasterns of the forelegs even knuckle over. This type of leg is very popular in England today and is expected at all important exhibitions of Foxhounds. For South African conditions, however, this type of foot is fatal. The ground surface is too uneven and too rough and hard, with the result that the small pad surface, which touches the ground, soon wears through.

The second type of foot is known as the hare foot. Here the pastern bones stand obliquely on the axis of the leg and the digits lie with an angle to the pasterns. A relatively large area of the toe pads is therefore in contact with the ground and there is a considerable amount of elasticity in the foot itself, an important factor on an uneven surface.

Both the Welsh and the Fell types possess hare feet and it is therefore essential to inbreed these in order to achieve a pack of hounds with good feet for South African conditions. It should be remembered, however, that this type of foot is developed to its limit in the Greyhound. This is a reason for the tremendous speed of this hound, but, unfortunately, this also means a measure of weakness in the joints. Accordingly the Greyhound cannot cover long distances without this weakness telling on it. A happy medium should, therefore, be striven for and it is essential that breeding animals be chosen in the field where they are under constant observation of the huntsman.



C.
A typical hare foot.



D.
'n Tipiese haaspoot.

prooi val. In ons veld, waar die honde sowel as die jakkals dikwels uit die oog verlore raak, sal die geblaf van die honde die regte koers vir die jagter aandui. Dit is noodsaaklik vir hom om te weet of die jakkals wel vernietig is en of hy net in 'n gat wegkruip. Selfs die beste jakkalshonde sal later omdraai as hulle vind dat hulle nie die jakkals in die gat kan bykom nie. Die gewoonte om dan by so 'n gat te staan en blaf, is dus 'n groot voordeel.

By die teel van honde vir Suid-Afrikaanse omstandighede is dit noodsaaklik om te onthou dat die rooijakkals heeltemal 'n ander dier as die Europese vos is. Hulle is wel verwante diere, maar die rooijakkals is heelwat groter, vinniger en meer aanvallend as die vos. Sonder om aan die vegvermoë van die vos te wil afbreuk doen, moet hier gekonstateer word dat dit sommer 'n goeie hond moet wees wat 'n rooijakkals wil aandurf.

Die eienskap om sy prooi dadelik te pak, is nie ewe sterk in alle jakkalshonde ontwikkel nie en die aanwesigheid van 'n ,, byter " in 'n span is 'n groot bate. Hierdie eienskap kan deur die regte keuse van teeldiere in die nageslag bevorder word, hoewel dit ook tot 'n groot mate deur afrigting verbeter kan word. Teen een ding moet egter gewaak word en dit is om bakleierige honde vir teeldoeleindes te gebruik. Sulke diere is 'n groot las in die hokke, hoewel ook dit tot 'n meerdere of mindere mate met strenge dissipline reggemaak kan word. Daar moet dus onderskei word tussen die goeie eienskap van onverskrokkenheid om sy prooi te takel en die swakheid om bloot bakleierig te wees.

Goedgeteelde jakkalshonde is gewoonlik fisies sterk genoeg om teen die rooijakkals op te weeg, maar met teling moet die kwessie van liggaamsgrootte deeglike aandag geniet. 'n Uitermate groot hond kan te lomp en swaar wees en selfs met sy uitstaande uithoudingsvermoë sal hy nie in staat wees om die jakkals in te haal nie. Aan die anderkant sal 'n hond wat te kort op die been is, ook nie die paal kan haal nie. Daar moet dus met die uitsoek van die teeldiere getrag word om honde te teel van 'n gerieflike grootte, wat nie te swaar van been is nie maar tog genoeg gewig besit om dadelik 'n groot voorsprong op hul veel ligter teenstander, die rooijakkals, te hê.

Alle goeie jakkalshonde sal die prooi tot die uiterste toe volg, selfs al sou die voortvlugtende ook skuiling in gate probeer soek. Een groot voordeel van groot genoeg honde is dat hulle self sal besef dat hulle nie kan ingaan nie. Daar is niks lastiger vir die jagter as om te vind dat van sy honde ingestorm het en in die gate vassit nie. Om 'n jakkalshond uit 'n erdvarkgat uit te grawe, is nie maklike werk nie. Deur regte afrigting kan jakkalshonde ook geleer word dat dit nie hul werk is om in gate in te kruip nie. Elke jagter het gewoonlik 'n paar Foxterriers by die perd om so 'n jakkals uit die gat te verwilder.

'n Saak wat dikwels nie genoeg aandag geniet by die teel van jakkalshonde nie, is kleur. Soos reeds genoem, is hulle oorwegend bont met die grootste oppervlakte gewoonlik wit en die res swart en bruin. Party is egter grootliks wit met ligbruin of bruin vlekke, terwyl ander weer byna oorwegend swart is. Op ons tipe landskap is 'n donkergekleurde hond moeilik waarneembaar op groot afstande en dit is dus wenslik dat hulle ligter van kleur moet wees. Baie ligte honde is egter geneig om albinoagtig te wees, en hierdie gebrek aan pigment in die vel is 'n groot nadeel in ons sonskyn. So 'n albino se neus brand gewoonlik velaf en sy ooglede is ook ontsteek. So 'n

A good voice and in particular, the correct use thereof, is an essential quality of the Foxhound. A musical voice can be in-bred but the correct use of it, must be acquired. With patience a Foxhound can be taught to bark only when it has uncovered the line of a jackal. There are, however, certain hounds which have the tendency to babble, that is to start barking for no rhyme or reason other than pure excitement. There is no mercy for such babblers for they should be cured of this habit forthwith or be destroyed. This type of hound should in any event never be used for breeding purposes. Unnecessary yelping and noise is definitely not conducive to successful jackal hunting.

As stated previously, the opinion has been expressed that a quiet hound stands a better chance of catching a Black-backed jackal, because the barking which commences as soon as the trail is taken up, gives the jackal timely warning for escape. It is true that the jackal is then warned of the hounds' approach, but it has also been found that the incessant barking eventually causes the jackal to become so panic-stricken that in the end it still falls an easier prey. On South African veld where both the hounds and the jackal are often lost to sight, the barking of the hounds will indicate the correct direction to the huntsman. It is essential for him to know whether the jackal has been destroyed or whether it has merely taken refuge in an earth. Even the best of Foxhounds will eventually turn back if they find that they cannot get at a jackal in an earth. Thus the practice of giving tongue when a jackal has been cornered in a burrow is a great advantage.

In the breeding of hounds for South African conditions, it is essential to remember that the Black-backed jackal is an entirely different animal to the European fox. These animals are related, but the Black-backed jackal is considerably larger, faster and more aggressive than the fox. Without slighting the fighting ability of the fox, it must be stated emphatically that the hound which dares to tackle the Black-backed jackal must be one of calibre.

The quality of intrepid tackling of its prey is not so well-developed in all Foxhounds and the presence of a biter in a pack is an asset. This quality can be promoted in the descendants by the correct choice of breeding animals, although it can to a large extent also be improved by training. One thing must be guarded against and that is the use of quarrelsome hounds for breeding purposes. Such hounds are a nuisance in the kennels, but even this failing can be corrected to a greater or lesser degree, by strict discipline. Therefore, distinction should be made between the good quality of intrepidity in tackling its quarry and the weakness of merely wanting to fight.

Well-bred Foxhounds are ordinarily physically strong enough to deal with the Black-backed jackal, but in breeding, the question of body size must receive particular attention. An outsize hound may be too clumsy and heavy and even with its exceptional stamina, not be able to overtake a jackal. On the other hand, a hound which is too short in the leg, will also be unable to keep up with the pack. In the selection of breeding animals, it should therefore be endeavoured to breed hounds of a convenient size, not too heavy in bone, but which will, nevertheless, have sufficient weight to give them an immediate advantage over their much lighter adversary, the Black-backed jackal.

All good Foxhounds will pursue their quarry to the end even if the fugitive seeks refuge in burrows. One advantage of large hounds is that

hond is dan nukkerig en geen bate in ’n span nie. By die uitsoek van teeldiere is dit dus nodig om eers goed vas te stel of daar enige neigings tot albinisme is. As daar is, moet hulle uitgeskakel word, want in die grootste gedeelte van Suid-Afrika moet weens die reënval in die somer gejag word. En selfs al is dit bewolk, is die aktiniese strale van die son nog deurdringend genoeg om skade te veroorsaak.

Kennis van die kleur van die voorgeslagte van die paar wat vir teel uitgesoek word, sal baie help omdat kleur in die reun ’n betreklik dominante eienskap is. Dit wil nie sê dat sy eie kleur en kleurpatroon oorgedra sal word nie, maar sy nageslag by verskillende tewe sal gewoonlik nagenoeg dieselfde kleur en kleurpatroon hê.

Dit vertoon altyd netjies as die lede van ’n span honde min of meer dieselfde kleur het. Net so min as wat ’n boer van ’n bont span muile of osse hou, net so min sal hy van ’n span honde hou waarvan party klein en die ander groot, party wit en ander bont is. ’n Span honde moet dus ook vir die oog ’n plesier wees. Dit kan ook met veiligheid aangeneem word dat die noodsaaklike eienskap van saamhorigheid by so ’n span kan verwag word.

Net soos telers van enige ander diersoort vind dat daar by selfs die besgeteelde stoetdiere ongewenste eienskappe kan voorkom, so word ongelukkig ook by honde ondervind. Dit is dus uiters noodsaaklik dat beide die teef en die reun wat vir teeldoeleindes uitgesoek word, eers hul waarde in die veld bewys het. In Engeland, waar hondeteelt ’n eeue-oue kuns is, is gevind dat sekere reuns uitstaande nageslagte teel. Hoewel daar geen biologiese bewyse voor is nie, word algemeen aangeneem dat ’n swakkerige teef by ’n uitstaande reun ’n beter werpsel teel as ’n uitstaande teef by ’n swakkerige reun. Die gebruik bestaan dan vrylik in Engeland om tewe na uitstaande reuns te neem of te stuur om gedek te word, eerder as om met ’n middelmatige reun tevrede te wees.

Nog ’n saak wat die uiterste noukeurigheid verg, is die eerste keer wat ’n teef gedek moet word. Volgens ons kennis van genetika is dit onmoontlik dat die eienskappe van die reun wat die eerste keer die teef gedek het, enige invloed sal hê op die werpsels wat later deur ander reuns verwek word. Tog sal ’n teler van stoetdiere tweekeer dink om ’n teef wat vir die eerste keer deur sommer ’n rondloperbrak gedek is, verder vir teel te gebruik. Daar is talle ondervindings van stoettelers, ook by perde, beeste, ens., wat vir die wetenskap onverklaarbaar is. Dit is dus wenslik om eerder versigtig te wees as om later die skade te ly.

’n Teef moet nie minder as ’n jaar oud wees voordat sy die eerste keer teel nie. Jong tewe word reeds op nege maande loops, maar dan is hulle nog nie uitgegroei nie en dit is dus wenslik dat hulle weggehou word.

Die loopsperiode is nege dae. Dit kan gebeur dat ’n teef reeds op die 6de of 7de dag beset sal raak, maar dit is baie beter om haar apart te hou en eers op die 9de dag, wanneer daar tekens van bloeding by die vulva is, die reun by te bring. Dit is natuurlik dat die twee sal vassit aangesien die bou van die reun se penis van so ’n aard is.

Dit is baie onwenslik dat die reun vroeër bygebring word, aangesien hulle dan herhaaldelik sal paar en te veel daarvan bevorder aborsie. As

they will themselves realise that they cannot enter the burrow. There is nothing more annoying for a huntsman than to find that some of the hounds have entered a burrow and become stuck. It is no easy task to extricate a hound from an antbear earth. By proper training Foxhounds can also be taught that it is not expected of them to enter burrows. Every huntsman usually has a few Foxterriers at hand for the purpose of driving the jackal from the earth.

A matter which is often not accorded enough attention in the breeding of Foxhounds, is colour. As already stated, they are predominately white, with black and tan markings. Some, however, are almost all-white with light brown or brown patches, while others again are predominately black. On the South African landscape a dark-coloured hound is not easily discernible at great distances and it is therefore desirable that hounds should be light in colour. Many lighter-coloured hounds, however, show an albino tendency and this lack of pigment in the skin is a great disadvantage in strong sunlight. The nose of the albino is usually sunburnt and its eyelids inflamed. A hound such as this is morose and no asset to the pack. In the selection of breeding animals it is, therefore, necessary to determine in the first instance whether there are any tendencies towards albinism. If there are, such hounds must be eliminated because in the greater part of South Africa hunts have to take place during the summer rainy season. Even when the sky is overcast the actinic rays of the sun are penetrating enough to cause damage.

Knowledge of the colour of the ancestors of the pair selected for breeding purposes, will be of great assistance because colour in the male is a relatively dominant factor. This does not imply that his own colour and colour pattern will be transmitted, but his progeny by different bitches will practically all show the same colour and colour pattern.

It is pleasing to have the members of the pack with more or less the same colour. Just as a farmer would not care to own a motley span of mules or oxen, so also he would not care to have a pack of hounds differing much in size and colour. A pack must therefore also be pleasing to the eye. It can then safely be assumed that the essential quality of pack coherence can be expected in such a case.

Just as breeders of any other species of animal find undesirable qualities in the best bred of stud animals, so also faults crop up in the breeding of hounds. It is, therefore, absolutely essential that both the bitch and the dog which are selected for breeding purposes, should first prove their worth in the field.

In England, where dog-breeding is centuries old, it has been found that certain sires breed outstanding progeny. Although there is no biological proof, it is generally assumed that a mediocre bitch, covered by an outstanding dog, breeds a better litter than an outstanding bitch, covered by a mediocre dog. Free use then is made in England, of the custom of taking or sending bitches to be covered by outstanding dogs rather than by being satisfied with a mediocre dog.

Another matter which requires the utmost exactitude is when the bitch must be covered for the first time. According to our knowledge of genetics it is impossible for the characteristics of the dog, which covered the bitch the first time, to have any influence on litters later sired by other dogs. Nevertheless the breeder of stud animals will consider twice before using a bitch which has been covered the first time by a vagrant mongrel, for further breeding purposes. Numerous experiences of stud breeders, also

aborsie nie geskied nie, kan dit gebeur dat die kleinhondjies enkele dae na mekaar gebore word, met die gevolg dat die jongstes nie teen die sterker, vroeër-gebore hondjies opgewasse is in die stryd om by die spene te kom nie, en gevolglik òf vrek, òf armoedig groot word.

Sodra 'n teef gedek is, moet sy vir 'n paar dae van reuns af weg gehou word, maar daarna kan sy weer by die span aansluit. Sy kan dan weer saam gaan jag. Daar is telers wat meen dat dit noodsaaklik is dat die teef so lank moontlik moet werk voordat sy afgesonder word om te werp. Die idee is dat die moed om aan te hou tenspyte van haar agterstand by die ander honde ook aan die ongebore embrios oorgedra word. Moed is natuurlik 'n baie gesogte eienskap by 'n jakkalshond, maar of dit die opoffering werd is, is moeilik om te bepaal aangesien so 'n teef dikwels aborteer en ook dikwels self in die proses vrek.

Aan die anderkant is gevind dat 'n teef wat vroegtydig afgesonder word in 'n plek waar sy normale oefening kan hê, maklik werp en ook gesonde kleinhondjies in die wêreld bring. Moed is tog immers 'n eienskap wat gewoonweg oorgedra word en ook een wat met afrigting bevorder kan word.

Nog 'n saak i.v.m. teling waaroor al baie geskryf en geredekawel is, is die kwessie van inteelt. Daar is verskillende outoriteite wat meen dat daar dikwels nie uitstaande diere geteel is nie omdat daar 'n gebrek aan moed was om tot inteelt oor te gaan.

By inteelt moet onthou word dat dit nie net die goeie eienskappe is wat in die nageslag verdubbel word nie, maar ook die slegtes. Inteelt openbaar homself dikwels in verskillende fisiese gebreke in die nageslag, soos bv. 'n gesplete huig, stramheid van een of meer ledemaatgewrigte of swak sintuie. Dit is dus vir die leek aangewese om inteelt maar liewer aan die gesaghebbende oor te laat, veral as in ag geneem word dat, soos hierbo aangevoer, ten spyte van ons kennis van die parings- en oorerwingsprosesse, 'n teef deur 'n ongewenste paring vir goed bederf kan raak.

Om enige standhoudende sukses te verwag, is dit vir die teler noodsaaklik om vroegtydig uit te werk net presies hoe hy meen om te teel. Sodra hy in die veld bepaal het watter reuns en tewe geskik sal wees vir teel, moet hy 'n teeltabel uitwerk en hom daarvolgens hou. Dit is wenslik dat alle ander reuns en tewe dan gesteriliseer word om enige moontlike kans van 'n ongeluk uit te skakel. In elk geval moet enige minderwaardige reun so gou moontlik gesteriliseer word.

Verder moet die teler ook die moed hê om enige hond wat enige ongewenste eienskap toon of wat die onderlinge saamhorigheid van sy span versteur, onmiddellik vankant te maak. 'n Swak hond kan te voorskyn tree en hy moet dan vroegtydig verwyder word.

Waar hierbo verwys is na verskillende tipes jakkalshonde en hul onderskeie kenmerke bespreek is, is dit miskien gewens om hier ook die opinie van 'n gesaghebbende teler soos mnr. P. Wilson te gee. Hy het nl. gevind dat 'n jakkalshond wat omtrent $\frac{1}{4}$ Walliese bloed, omtrent $\frac{1}{8}$ Engelse bloed en die res Fell-bloed het, die beste hond vir Suid-Afrikaanse omstandighede is om die rooijakkalsprobleem die hoof te bied, mits al die honde wat in die teelproses gebruik is, natuurlik eers in die veld bewys het dat hulle kan werk.

with horses, cattle, etc., remain unsolved by science. It is, therefore, advisable to take great care rather than suffer disappointment later.

A bitch must not be younger than a year before she breeds for the first time. At the age of nine months young bitches are already ruttish, but they are then not yet fully developed and it is thus desirable to keep them away from dogs.

The rut lasts nine days. It may be that the bitch has already conceived on the sixth or the seventh day, but it is far better to keep her isolated and to bring her to the dog on the ninth day, when there are signs of bleeding from the vulva. It is quite natural that they will remain interlocked since the structure of the dog's penis is of such a nature. It is very undesirable that the hounds be allowed to copulate earlier since this will lead to repeated pairing and too much of this will promote abortion. If abortion does not occur, it may be that the pups will be born at intervals of a few days with the result that the youngest are no match for the stronger, first-born pups in the struggle to get to the teats, and consequently either die or remain under-developed.

As soon as a bitch has been covered, she must be kept away from the other hounds for a few days and then allowed to rejoin the pack. She can also then be allowed to hunt. Some breeders are of the opinion that it is essential that the bitch must work as long as possible before she is isolated to litter. The idea is that the courage it takes to persevere in spite of her handicap in relation to the other hounds, is transmitted to the yet unborn embryos. Courage, of course, is a quality much sought after in a Foxhound, but it is difficult to determine whether it is worth the sacrifice, considering that such a bitch often aborts and also very often dies in the process. On the other hand it has been found that a bitch, which has been given timely isolation in a place where she can exercise normally, litters easily and bears healthy pups. Courage is plainly a quality which is inherited and one which can be improved by training.

Another controversial matter in connection with breeding is the question of in-breeding. Various authorities are of the opinion that outstanding animals are frequently not bred because of a lack of courage to attempt in-breeding.

It must be remembered that with in-breeding it is not only the good qualities that are doubled in the progeny, but also the faults. In-breeding often discloses various physical defects in the progeny e.g., split palate, stiffness in one or other of the limb-joints, or weak sensory organs. It is therefore advisable that the amateur should rather leave in-breeding to authorities, particularly if it is taken into account, as mentioned above, that in spite of the knowledge of the crossing and heredity processes, a bitch can be spoilt for good by an undesirable crossing.

For a breeder to achieve any measure of permanent success, it is essential that he should determine beforehand precisely how he intends to set about the breeding. As soon as he has determined in the field which dogs and bitches will be suitable for breeding, he must draw up a breeding-table and adhere to this. It is desirable that all other dogs and bitches then be sterilized in order to eliminate all possible chance of accident. In any event mediocre males must be sterilized as soon as possible.

Furthermore the breeder must possess the courage to destroy immediately any hound that exhibits any undesirable quality or which disturbs the coherence of its pack. A poor hound may crop up and it must be eliminated as soon as possible.

Daar is enkele tekens waaraan duidelik uitgemaak kan word wanneer die teef gaan werp. Die grofheid van haar liggaamsbou is gewoonlik die duidelikste, maar gebrek aan eetlus en algemene senuweeagtigheid kan ook opgemerk word.

As 'n teef besig is om te werp, of pas daarmee klaar is, is dit noodsaaklik dat sy soveel moontlik alleen gelaat word. Dit is nie wenslik om haar met meer as skoon kooigoed, kos en vars water te voorsien nie. Die kleintjies moet so min moontlik hanteer word, maar wanneer dit ook al nodig is om iets in die teelhok te doen, moet daar besonder aandag aan die teef gegee word en aan die kleintjies bloot terloops. Die teef is besonder gevoelig vir vleitaal en dit is bevorderlik om haar soveel moontlik te prys terwyl daar in die hok gewerk word. 'n Jaloerse teef sal dit nie ontsien om al haar kleintjies vrek te byt nie.

Gebrek aan sekere noodsaaklike kosstowwe kan 'n nadelige effek op die kleintjies hê, maar as die ongebore kleintjies te veel op die moederlike liggaam moet teer, kan dit gebeur dat die drang na hierdie stowwe so erg word, dat sy haar eie werpsel sal opvreet sodra hulle gebore word. As die teef egter van 'n goeie, voedsame en gebalanseerde dieet voorsien was, sal soiets nie gebeur nie. Sorg moet egter gedra word dat die teef nie te veel gevoer word voor sy werp nie. Die embrios ontwikkel in so 'n geval so groot dat hulle nie gewerp kan word nie, met die gevolg dat die teef vrek.

Where reference has been made above to various types of Foxhounds and where their respective characteristics have been discussed, it is perhaps desirable to quote the opinion of an authoritative breeder, viz., Mr. P. Wilson. He found for example that a Foxhound with approximately $\frac{1}{4}$ Welsh strain, approximately $\frac{1}{8}$ standard Foxhound strain and the balance Fell blood, to be the best hound for South African conditions to make headway against the Black-backed jackal, provided naturally that all the hounds used in the breeding process, have proved their worth in the field.

There are a few signs which clearly indicate when a bitch is about to pup. The gross size of her body is generally the most indicative, but lack of appetite and general nervousness are also apparent.

If a bitch is in labour or immediately after the birth, it is essential that she be left alone as much as possible. It is desirable to supply her with no more than clean bedding, food and fresh water. The pups must be handled as little as possible, but whenever it is necessary to enter the breeding kennel, particular notice should be taken of the bitch and only casual attention paid to the pups. The bitch is particularly susceptible to flattery and it is of benefit to praise her as much as possible while working in the kennel. A jealous bitch will not hesitate to bite her young to death.

The absence of certain essential foodstuffs can have a detrimental effect on the pups, but if the unborn pups take too heavy a toll from the mother's body, it can happen that the craving for these foodstuffs becomes so intense that she will devour the litter at birth. If, however, the bitch is provided with a good, wholesome and balanced diet, this will never happen. Care should be taken that the bitch is not overfed before she litters. In such a case the embryos develop to such an extent that they cannot be born, with the result that the bitch dies.

AFRIGTING

deur D. E. Compion

BY sommige mense is dit natuurlik om met die afrigting van honde te slaag, terwyl andere, alle goeie pogings ten spyt, dit nooit sal regkry nie. Alles hang af van hoever 'n persoon 'n hond se vertroue kan wen, maar op dieselfde onverklaarbare wyse as wat 'n kind hom na sekere onbekende volwasse persone aangetrokke voel, net so sal 'n hond hom blindelings aan die sorg en afrigting van sekere mense onderwerp, terwyl dit nie teenoor andere sal gebeur nie.

Dit is baie waarskynlik dat 'n persoon wat van kindsdag af lief was vir honde en ook sy eie honde gehad het om mee te speel, sal slaag as 'n afrigter, terwyl een wat as 'n kind bang en sku was vir honde, na alle waarskynlikheid sal misluk.

Dit is absoluut noodsaaklik dat 'n afrigter en elke hond in sy span mekaar se wedersydse liefde, vertroue en agting moet geniet, maar hierdie dinge is nie van die begin af by die klein hondjie nie, omdat hy op daardie stadium nog geen begrippe kan vorm nie. Dit sal egter gaandeweg ontwikkel, soos hy meer en meer met sy baas in aanraking kom, omdat hy van die begin af baie afhanklik van sy baas sal wees.

Elke afrigter moet besef dat 'n hond net 'n beperkte hoeveelheid woorde sal verstaan; hoe minder die aantal woorde wat dus gebruik word, hoe intelligenter sal die hond optree.

'n Tweede, maar ewe belangrike saak om te onthou, is dat 'n jakkalshond geen huishond of hanswors is wat allerhande kunsies moet aanleer nie. Hy is 'n hond wat afgerig moet word om jakkalse te vang, en sy hele afrigtingsproses moet hierop ingestel word.

Gerieflikheidshalwe word die afrigting van die jakkalshond hier in drie stadia bespreek, nl.:—

(1) Klein hondjies, d.w.s. vanaf speenoud tot ongeveer ses maande.
(2) Jong honde, d.w.s. vanaf ses maande tot ongeveer twee jaar oud.
(3) Volwasse honde, d.w.s. vanaf twee jaar en ouer.

Die afrigting van die klein hondjie begin sodra hy gespeen is en dit word gebaseer op sekere primêre behoeftes en drange wat by alle klein hondjies aanwesig is. Daar word egter altyd, sover moontlik, van 'n afgerigte volwasse hond gebruikgemaak, verkieslik sy ma, omdat hy dan baie vinniger sal leer.

Die eerste ding wat 'n hondjie moet leer is dat hy sy eie naam het en ook hier moet die afrigter besef dat nie sommer enige naam goed genoeg is nie. Dit moet 'n naam wees wat uitgeskreeu kan word as hy miskien van ver af teruggeroep moet word. Daar moet ook gewaak word teen die gebruik om 'n hond sommer met enige verspotte naam af te skeep. 'n Hond is baie gevoelig vir die buigings en intonasies van sy baas se stem en dit gaan moeilik om 'n verspotte naam op so n' manier uit te spreek dat die hond dit nie sal aanvoel nie. As hy dan meen dat sy baas hom as 'n nar beskou, sal hy bloot om sy baas te plesier, hom dan ook so gedra.

TRAINING

by D. E. Compion

IT is natural for some people to be successful in the training of dogs, whereas, in spite of every good effort, others will never succeed. Everything depends on the measure in which a person can win a dog's confidence, but in the same inexplicable way in which a child will feel attracted to certain unknown adults, a dog will subject himself blindly to the care and training of certain people, while he will not do so towards others.

It is very likely that a person who was fond of dogs from his childhood and who also had his own dogs to play with, will be a successful trainer, while one who was frightened of and avoided dogs, will probably fail.

It is absolutely essential that a trainer and every hound in his pack should have each other's mutual love, trust and respect, but these qualities are not found in a small puppy right from the beginning for at that stage he is not yet capable of understanding them. This will gradually develop, however, as contact between him and his master increases, since he will be very dependent upon his master from the very beginning.

Every trainer should realise that a dog will understand a limited number of words only; thus the fewer words used, the more intelligently the dog will act.

A second, but equally important factor to be borne in mind is that a Foxhound is no housedog or clown to be taught all kinds of tricks. The Foxhound is one that has to be trained to catch jackals and the whole proeess of his training must be based upon this.

For the sake of convenience the training of Foxhounds is discussed here in three stages, viz.—

(1) Puppies, i.e. from weaning age to approximately six months.
(2) Young hounds, i.e. from six months to approximately two years.
(3) Adult hounds, i.e. from two years and over.

The training of the puppy commences as soon as he has been weaned and is based on certain primary needs and impulses which are present in all puppies. As far as possible, however, use is always made of a trained adult dog, preferably his mother, as he will then learn much faster.

The first thing a puppy has to learn is that he has his own name, and here too the trainer must realise that any old name is not good enough. It must be a name that can be shouted out if he has to be called back from a long distance. One should also guard against the custom of just giving a dog any silly name. A dog is very sensitive to the modulation and intonation of his master's voice and it is difficult to pronounce a silly name in such a manner that the dog will not sense it. If he thinks that his master regards him as a clown he will, merely to please his master, behave in such a manner too.

'n Ander ewe slegte gebruik is om 'n hond se naam af te kort of op verskillende maniere uit te spreek. Dit is uiters verwarrend vir die hond en daar kan nie verwag word dat hy altyd reg sal reageer as hy nou op die een en dan op die ander naam genoem word nie.

Om sy naam te leer ken, word gebruikgemaak van sy behoefte aan kos, aandag en ook die drang om te wil speel. Enige hond en veral 'n klein hondjie wil daarvan bewus wees dat juis hy iets belangriks is. Dit is vleiend vir sy ego en hy sal haas enigiets doen net om sy baas te plesier. Hoe meer aandag daar dan spesifiek aan hom bestee word, hoe geredeliker sal hy probeer om op 'n bevel reg te reageer en hoe gouer sal hy weet dat daar juis na hom geroep word. Sy behoefte aan kos kan hier ook op 'n gerieflike manier uitgebuit word. Deur hom elke keer op sy naam te roep wanneer dit feitlik vanselfsprekend is dat hy sal kom, omdat daar bv. kos is, sal hy gou genoeg leer om op sy naam te reageer.

'n Hond is nie alleen baie gevoelig vir vleitaal nie, maar hy het 'n groot behoefte daaraan. As 'n hond iets reg gedoen het, is dit noodsaaklik dat die baas hom daaroor moet prys, en by 'n klein hondjie is dit net so, miskien nog belangriker, al was sy pogings ook al hoe lomp. Enige waardering van sy pogings bevorder sy liefde vir sy baas.

Agting vir sy baas vind oorsprong in die dissiplinering van die hond. Sy baas moet beslis wees en voordat 'n bevel gegee word, moet die afrigter seker wees wat hy die hond wil laat doen. Besluitloosheid is verwarrend en kan veroorsaak dat 'n belowende hondjie bederf raak. Vir sy oordeel van wat reg of verkeerd is, is die hondjie afhanklik van die lesse wat hom geleer word. Dit is dus noodsaaklik dat hy nie die een dag iets toegelaat word wat hom die volgende dag geweier sal word nie. 'n Verkeerde pak slae op 'n onbesonne manier toegedien, kan 'n klein hondjie vir goed breek.

Een eienskap wat elke afrigter moet besit is geduld, en al word dié ook tot watter mate beproef, moet hy nog bereid wees om enige poging van die hondjie, al is dit ver van reg, aan te moedig. Aan die anderkant moet die afrigter ook weet wanneer om van tug gebruik te maak. Uitskel en slegsê is nie tug nie, dit laat net die hond minderwaardig voel. Tug beteken hier lyfstraf en kan of met 'n sweep toegedien word of die hond se ore kan getrek word. As lyfstraf nodig is, moet dit beslis, maar nie moorddadig toegedien word nie, en dit moet op die oomblik wat oortree word, toegedien word sodat die hondjie die verkeerde daad met die straf sal assosieer. Om 'n hondjie te straf oor iets wat 'n geruime tyd gelede gebeur het, is wreedheid. As lyfstraf toegedien word, moet daar vir die hond met so min moontlik woorde verduidelik word waarom hy gestraf word.

Onmiddellik na lyfstraf toegedien is, moet die afrigter die hondjie self troos en met hom mooipraat. Die hondjie moet besef dat hy vergewe is en dat die saak afgehandel is. Die maklikste manier om alle vroeëre goeie werk te vernietig, is om 'n hondjie te straf en hom dan net so te los. Alle vertroue en agting vir sy baas is daarmee heen. Een ding moet nooit gebeur nie en dit is dat 'n afrigter ooit 'n hond sal skop. Dit sal gevind word dat 'n hondjie wat gestraf is, daarna maklik deur sy spanmaats toegetakel sal word. Afrigters glo graag dat dit uit lojaliteit teenoor hul baas is en dat die ander die sondaar wil leer om nie weer sy span in die steek te laat nie. Wat ook die geval mag wees, die afrigter moet eers 'n ruk in die hok vertoef totdat hy sien dat niks verder sal gebeur nie. So 'n hondjie kan maklik doodgebyt word.

Another equally bad habit is that of abbreviating a dog's name or of pronouncing it in different ways. It is extremely confusing to the dog, and one cannot expect him always to react in the right way if he is called now by one name and then by another.

To teach a dog to know his name, use is made of his need for food, attention and of his urge to play. Any dog, and especially a puppy, wants to be aware of his own importance. It is flattering to his ego and he will do almost anything just to please his master. The more attention is given to him specifically, the more readily he will try to react in the right way to a command, and the sooner he will know that it is he who is being called. His need for food can also be conveniently exploited in this manner. By calling him by his name whenever it is almost a foregone conclusion that he will come, e.g. because there is food for him, he will soon enough learn to react to his name.

A dog is not only very susceptible to flattery, but he has a great need of it. When a dog has done something correctly, it is essential that his master should praise him, and this is true of a puppy too, perhaps even more so, however clumsy his efforts may have been. Any appreciation of his efforts promotes his love for his master.

Respect for his master originates in the discipline of the dog. His master should be resolute and before a command is given the trainer must be sure of what he wants the dog to do. Indecision is confusing and may cause a promising puppy to become spoilt. In his judgment of right and wrong a puppy is dependent on the lessons taught him. It is thus essential that he is not allowed something one day which will be refused him the next. A whipping given wrongfully in a thoughtless manner can break a puppy permanently.

One characteristic which every trainer must have is patience and, though this may be tried to the utmost, he must still be prepared to encourage any effort of the puppy's, even though this may be far from right. On the other hand the trainer must also know when to punish a dog. Scolding and abuse are not punishment, they merely make the dog feel inferior. Here punishment means corporal punishment which can be administered either by means of a whip or by pulling the dog's ears. When corporal punishment is necessary this must be given firmly but not cruelly, and must be given at the moment when the offence takes place so that the puppy will associate the punishment with the offence. To punish a puppy for something that took place a good while before, is cruelty. While administering corporal punishment it should be explained to the dog, in as few words as possible, why he is being punished.

Immediately after punishment the trainer himself should comfort the puppy and speak gently to him. The puppy must realise that he has been forgiven and that the matter is finished. The easiest way to undo all previous good work is to punish the puppy and then to give him no further attention. He will lose all his confidence in and respect for his master. One thing a trainer should never do is to kick a dog. It will be found that a puppy that has been punished is often tackled by his pack mates. Trainers like to believe that this is out of loyalty towards their master and that the others want to teach the offender not to let his pack down in future. Whatever

Die beste leermeester vir 'n span jong, pasgespeende hondjies is 'n ou goedgeaarde, geduldige hond. Tot speenoud het hulle ma die rol gevul, maar daarna is 'n ander hond beter aangesien die jonges hulle dan nie soveel vryhede as teenoor hul ma kan veroorloof nie. Ook kan dit gebeur dat hulle haar spene te veel verniel aangesien hulle tandjies dan baie skerp is. So 'n ou hond is gewoonlik intelligent genoeg om te weet wat van hom verwag word en sal die klein hondjies gou onder beheer kry. Aan die anderkant sal die jonges gou genoeg leer om te kyk wat die ou hond maak en sodoende uitvind om die regte ding op die regte tyd te doen. As hulle nog nie 'n bevel begryp nie, sal hulle deur na die ou hond te kyk vir leiding, reg reageer.

Die veldwerk van die klein hondjies is eenvoudig maar uiters belangrik. Elke jaghond word met sekere natuurlike instinkte gebore en deur op te let hoe die ouer hond werk, kan hulle vinnig leer.

Aan die begin word die klein hondjies te voet uitgeneem, maar sodra hulle groot genoeg is, gaan die afrigter te perd saam. Dit is by die hondjies ingebore om spoor te soek en te volg, en al is dit nou ook al 'n meerkatspoor, moet hulle aangemoedig word om dit te volg. Sodra een 'n spoor het, sal hy in sy opgewondenheid begin blaf en die ander sal uit pure nuuskierigheid naderkom, ook die spoor optel en al keffende die eerste een agterna sit. Sorg moet egter gedra word dat dit nie 'n wildspoor is nie.

Hier moet die eerste belangrike les van die veld tuisgebring word. 'n Jakkalshond moet met sy neus werk en nie op sy oë staatmaak nie. Enige poging om met sy oë te werk, moet ontmoedig word. Hy moet nie blaffende agter die eerste een wat die neus op die spoor het, hardloop nie; hy moet self die spoor met sy neus volg.

Dit is ingebore by 'n jakkalshond om aan te hou totdat hy sy prooi gevang en miskien nog opgevreet het, maar aangesien dit bra onwaarskynlik is dat hulle op hierdie stadium al 'n meerkat sal kan inhaal, moet die afrigter daarvoor vergoed deur hulle oorbodig te prys en aan te moedig. So ver soos hy met sy span terugstap, moet hy hulle lof toeswaai.

Lê van 'n spoor. Making a drag.

the case may be, the trainer should remain in the run for a little while until he sees that nothing more is likely to happen. Such a puppy could easily be bitten to death.

The best teacher for a pack of young newly-weaned puppies is an old, good-natured, patient dog. Up to weaning age their mother filled this rôle, but after that another dog is better since the young ones will not be able to take the same liberties as they did with their mother. They could also damage her nipples, for their teeth would then be very sharp. Such an old dog is generally intelligent enough to know what is expected of him, and he will soon have the puppies under control. On the other hand the young ones will soon enough learn to watch the old dog's actions and, in doing so, will find out how to do the right thing at the right time. If they are still unable to understand a command, they will react correctly by looking to the old dog for guidance.

The field training of the puppies is simple but extremely important. Every hound is born with certain natural instincts and by watching the older hounds at work, they can learn rapidly.

At first the puppies are taken out on foot but, as soon as they are big enough, the trainer goes with them on horseback. It is inborn in puppies to look for scents and to follow them and, even if these are only meercat scents, the puppies should be encouraged to follow them. As soon as one has found a scent, he will start barking in his excitement, the others will come nearer out of sheer curiosity, will also get the scent and will chase after the first one, yapping all the way. One must, however, take care that they do not follow a game scent.

Here the most important lesson of the field must be brought home to them. A Foxhound must use his nose and must not rely upon his eyes. Any attempt to use his eyes must be discouraged. He must not just run barking after the first one following the scent; he himself must follow the scent with his nose.

It is inborn in a Foxhound to persevere until he has caught and perhaps even eaten his prey, but it is very unlikely that at this stage the puppies will already be able to catch a meercat, therefore the trainer must make up for it by praising and encouraging them lavishly. On the way back he should praise his pack as far as he goes.

As soon as the youngsters are a little bigger and can follow a scent, they have to become accustomed to that of a jackal. For this purpose a sack on which a jackal has slept is dragged through the veld and the puppies are then brought onto this " drag ". To teach the puppy what scent he has been following, it is necessary to have a jackal in a proper cage at the other end of the drag. They will learn soon enough that the scent on the drag is that of the jackal in the cage. As soon as the puppy has started these lessons, he must be taught to chase nothing else, however fresh and tempting the scent may be.

The trainer must be warned against one thing, however, and that is that he must not take his pack to the same place every day. He must always strike out in a new direction, otherwise the puppies will soon know the path

Sodra die jongspan 'n bietjie groter is en 'n spoor kan volg, moet hulle aan 'n jakkals se reuk begin gewoon word. Vir hierdie doel word 'n sak waarop 'n jakkals geslaap het, deur die veld gesleep en die jong hondjies word dan op die sleepsel gebring. Om die hondjie te leer watter reuk hy gevolg het, is dit nodig om 'n jakkals in 'n behoorlike hok aan die einde van die sleepsel te hê. Hulle sal gou genoeg leer dat die reuk op die sleepsel dié van die jakkals in die kas is. Sodra die jong hondjie met hierdie lesse begin, moet hy geleer word om niks verder te jaag nie, al is die spoor ook hoe vars en aanloklik.

Teen een ding moet egter gewaarsku word en dit is dat die afrigter nie elke dag van dieselfde plek gebruik moet maak nie. Daar moet altyd 'n nuwe koers ingeslaan word, so nie sal die hondjies gou genoeg die paadjie ken en dit kop-in-die-lug afhardloop sonder om ooit van hul neuse gebruik te maak. Ook kan dit gebeur dat, sodra die hek oopgemaak word, almal sal uitstorm en die paadjie so gou moontlik afhardloop en weer terugkom hoktoe.

'n Klein hondjie moet so gou moontlik jakkalsbloed proe. Dit kan alleen gedoen word op die manier wat in Engeland bekend staan as „ cub hunting ". In Suid-Afrika moet jong jakkalsies uitgegrawe en een-een op 'n geskikte plek vir die span hondjies gelos word. Die afrigter moet egter sorg dat hy nie 'n jakkalsie gebruik wat te sterk vir die hondjies is nie. Ook moet hy sorg dat die jakkals nie wegkom nie. Wat gewoonlik gedoen word, is om die jakkalsie eers 'n endjie te lei voordat hy gelos word, sodat die span hondjies eers die spoor kan vat en volg. Dit sal nie nodig wees om vir hulle te leer hoe om hom te vang en dood te maak nie, dit is by hulle ingebore. Hier moet egter gewaarsku word dat die jakkalsie nie te veel deur mense hanteer moet word nie, want dan sal daar te veel mensreuk aan hom kleef en die hondjies sal weier om hom te vang.

Een les wat vroeg by 'n jakkalshondjie moet inslaan, is dat hy een van 'n span is. Daar is by hom reeds 'n neiging tot spanwerk en deur hom met sy spanmaats saam uit dieselfde trog te laat vreet en in dieselfde hok te laat woon, bevorder die afrigter die spangees. 'n Hond wat later geneig is om alleen te jag, sal die verantwoordelike persoon oneindige moeite besorg. So 'n hond is gewoonlik weg as hy gelaai moet word vir die terugkeer en dit kan gebeur dat hy wel 'n jakkals gekry het maar, aangesien daar geen hulp was nie, die kans verlore gegaan het.

Hierdie spangees kan ook ontwikkel word deur die hondjies vanaf die eerste dag in die veld soveel moontlik op 'n bondel te probeer hou en so te leer om bymekaar te bly. As hulle eie ma aan die begin saam uitgaan, sal hulle by haar probeer hou. Dit sal ook later met 'n ander hond wat die werk van die ma oorgeneem het, die geval wees.

Van hul derde maand af moet die klein hondjies geleer word om aan perde en voertuie gewoond te raak. Hulle moet geleer word om by die perd te bly sonder om te veel vryhede te neem en seer te kry. Sodra hulle in die veld kom moet hulle 'n bietjie skiet kry om spore te kan soek. Aan die vragmotor waarin hulle vervoer word, sal hulle baie gou gewoond raak en vir die ry word hulle later baie lief, maar dit kos soms baie geduld om hulle te leer om self in te klim. Hier moet hulle net behoorlik aangekeer word, want 'n onnodige geskreeu maak hulle verbouereerd en bang.

'n Hond van ses maande na twee jaar word beskou as 'n jong hond. Die lesse wat hy in sy eerste lewensmaande moes leer, word nou met mening aangepak.

and will run along it with heads up, without using their noses at all. It is also possible that, as soon as the gate is opened, they will all charge out, rush along the path at top speed and then return to their kennel.

A puppy must taste jackal blood as soon as possible. This can only be done in the manner known in England as cub hunting. In South Africa jackal cubs have to be dug out and released one by one for the pack of puppies at a suitable place. The trainer must, however, take care not to use a jackal cub that is too strong for the puppies. He must also see that the jackal cub does not escape. What is usually done is to lead the jackal cub a little way before releasing it, to give the puppies a chance to pick up and follow the scent. It will not be necessary to teach them to catch and kill it; this is inborn in them. The trainer must, however, be warned not to allow the jackal cub to be handled too much by people, for then too much of the human smell will cling to it and the puppies will refuse to catch it.

One lesson which a young Foxhound must learn very early is that he is one of a pack. He already has a tendency towards team work, and the trainer can promote the pack spirit by letting him feed out of the same trough with the rest and letting him live in the same kennel with them. A hound that afterwards has a tendency to hunt alone will give the responsible person endless trouble. Such a hound is generally missing when he has to be entrucked for the return journey, and it is possible that he could actually have found a jackal but, as there was no help, the opportunity was lost.

This pack spirit can also be developed by trying, right from the outset, to keep the puppies as close together as possible, thus teaching them to remain together. If their own mother goes out with them in the beginning, they will try to keep near her. Afterwards this will also be the case when another hound has taken over the work of the mother.

From their third month onwards the puppies have to be taught to become accustomed to horses and vehicles. They have to be taught to remain near to the horse without taking too many liberties and getting hurt. As soon as they get into the veld they must be given a little rein to enable them to hunt for scents. They will soon become accustomed to the lorry in which they are conveyed, and they will eventually like the ride very much, but sometimes much patience is necessary in teaching them to get in by themselves. Here they have merely to be rounded up properly, for unnecessary shouting bewilders and frightens them.

A hound between six months and two years is regarded as a young hound. The lessons he has had to learn during the first months of his life, are now applied more seriously.

The first requirement of a young hound is discipline. Obedience is now essential and when the trainer speaks or cracks the whip, the young hound must react. Any hound that rebels must be punished immediately, but if this is of no avail, such a hound should be eliminated and perhaps even destroyed, since disobedience can be contagious to the whole pack. It must always be borne in mind, however, that persuasion will be much better than punishment in the case of certain timid hounds. If a hound is so spoilt that he has to be destroyed, one can only assume that he was not taught his lessons at the right time and in the right way.

Die eerste vereiste vir 'n jong hond is dissipline. Gehoorsaamheid is nou noodsaaklik en as die afrigter praat of met die sweep klap, moet daarop gereageer word. Enige hond wat hierteen rebelleer, moet dadelik gestraf word, maar as dit nie help nie, moet so 'n hond uitgeskakel, miskien selfs vernietig word, aangesien ongehoorsaamheid aansteeklik werk op die res van die span. Daar moet egter altyd onthou word dat mooipraat vir sekere skugtere honde baie beter as straf sal wees. As 'n hond so bederf is dat hy vernietig moet word, kan net aangeneem word dat sy lesse nie op die regte tyd en regte manier geleer is nie.

Soos by klein hondjies, is dit uiters noodsaaklik dat die afrigter baie beslis sal wees, want besluiteloosheid sal gebrek aan agting in die hand werk. Beslistheid beteken hier gladnie kwaai wees nie. Dit beteken dat as 'n bevel gegee word, dit uitgevoer moet word, maar daar moet ruimte wees dat die hond sy eie intelligensie ook kan volg.

Dit is goed dat die afrigter die hond so naby moontlik aan die spoor bring, maar dan moet hy kans kry om dit self te soek. 'n Jong hond wat herhaalde kere deur die afrigter op die spoor gebring word, sal naderhand daarop staatmaak en gladnie probeer om dit self te soek nie. Hy sal net by die perd bly en sy baas dophou. In so 'n geval gebeur dit gewoonlik dat die hond gladnie sy neus gebruik nie en bloot op sy oë begin staatmaak. Wat die jagter betref, kon hy liewer enige ander soort hond by hom hê want gesig is nie die beste van die jakkalshond se sintuie nie.

Net soos by mense bestaan daar by honde altyd enkele natuurlike leiers. Dit is nie noodwendig die klein bullebak wat aan die begin vinnig ontwikkel deurdat hy sterk genoeg is om die swakkeres van die kosbak weg te karnuffel, wat 'n leier word nie. Dit kan selfs die kleinste en tingerigste onder twee of drie werpsels wees wat later in 'n leier gaan ontwikkel.

Enige afrigter met ondervinding kan reeds vroeg die toekomstige leierhond uitken en, deur taktvol te werk te gaan, so 'n hond vir sy latere taak voorberei sonder om die ander in die span te laat voel dat hulle noodwendig minderwaardig is.

'n Leierhond moet streng gedissiplineer wees en hierdie dissipline moet van baie jonk af tuisgebring word. Teen een groot gevaar moet egter gewaarsku word en dit is dat die hond se moed en eie vernuf nie gebreek word onder die waan dat hy gedissiplineer word nie. Dissipline by 'n hond beteken dat hy redelik gou op 'n bevel sal reageer en ook reg sal reageer. Dit beteken nie 'n blinde, kruiperige soort van onderhorigheid wat eerder veragting by die afrigter sal opwek nie. 'n Kruiperige hond verraai swak afrigting; alleen 'n hond waarvan alle moed en selfstandigheid gebreek is deur skop en slaan, sal so geaard wees.

'n Goeie hond geniet sy werk en daar is niks meer steurend vir hom as dat hy weggeroep sal word wanneer hy hom met sy pligte besig hou nie. Hy wil sy werk klaarmaak en dan wil hy die dank en lof hê wat hom toekom. 'n Afrigter wat suinig is om sy honde lof toe te swaai, is self verantwoordelik vir die bederf van sy span. Dit kan dus begryp word dat 'n leierhond wat hom in die veld onderskei het en moeg en pootseer op 'n bietjie aanmoediging wag, teleurgesteld sal wees as hy dit nie kry nie. Dit is nogal niks ongewoons dat so 'n leier, by gebrek aan lof en aanmoediging, iets heeltemal onverantwoordeliks sal doen net om 'n bietjie aandag te kry nie, al is dit in die vorm van 'n pak slae.

As in the case of puppies, it is absolutely essential for the trainer to be very firm, for indecision will promote lack of respect. Here firmness certainly does not mean being too severe. It means that when a command has been given, it must be carried out, but the hound should be given enough scope to use his own intelligence too.

It is advisable for the trainer to bring the hound as close to the scent as possible, but then he must be given the opportunity of finding it himself. A young hound that is repeatedly brought onto the scent by the trainer, will eventually come to rely upon this and will never try to feel for it himself. He will simply remain near the horse and watch his master. In such a case a hound hardly ever uses his nose and starts to rely upon his eyes only. As far as the huntsman is concerned, he could rather have had any other kind of dog with him for a foxhound's vision is not the best of his senses.

As in the case of human beings, there are always a few natural leaders amongst dogs. It is not necessarily the young bully that develops rapidly in the beginning through being strong enough to jostle the weaker ones away from the food trough that becomes a leader. It could even be the smallest and most delicate puppy amongst two or three litters that will eventually develop into a leader.

Any experienced trainer can very soon recognise the prospective leader hound and, by setting about it tactfully, can prepare such a hound for his subsequent task without necessarily making the others in the pack feel that they are inferior.

A leader hound must be strictly disciplined, and this descipline must be brought home at a very early age. The trainer must be warned against one great danger and that is that he must not break the hound's own courage and ingenuity under the delusion that the hound is being disciplined. Discipline, in the case of a dog, means that he will react to a command reasonably quickly and that he will react correctly. It does not mean a blind, cringing sort of servility which would sooner make the trainer despise him. A cringing dog betrays poor training; only a dog whose courage and self-reliance have been completely broken by kicking and beating, will develop such a nature.

A good hound enjoys his work and there is nothing more disturbing to him than to be called away while he is busy doing his duty. He wants to finish his work and then he wants the thanks and praise which he deserves. A trainer who is sparing with his praise for his hounds, has only himself to blame for the spoiling of his pack. It is therefore understandable that a leader hound that has distinguised himself in the veld and that waits, tired and footsore, for a little encouragement, will be disappointed if he does not get it. It is actually not unusual for such a leader, lacking praise and encouragement, to do something quite irresponsible so as merely to get a little attention, even if this is in the form of a whipping.

The important lesson for young hounds is to learn to know jackals' scents only and to ignore those of other animals. It is necessary to train them not only among sheep, cattle and other farm animals, but also among

Jong honde se groot les is om net jakkalsspore te leer ken en die spore van ander diere te ignoreer. Dit is nodig om hulle nie alleen tussen skape, beeste en ander plaasdiere af te rig nie, maar ook tussen wild. Van die spore van al die Suid-Afrikaanse wild is dié van die vaalribbok die misleidendste. Selfs gedugte leiers kan hier fout maak maar as hulle goed gedissiplineer is, kan die jagter hulle met net die klap van sy sweep daarvan afkry.

Enige hond sal agterna storm as 'n haas of 'n wildsbokkie skielik voor hom opspring, maar as hy vroeg genoeg sy les geleer het, sal 'n jakkalshond hom hier maklik bedwing. Dit is net so belangrik as met dwaal op 'n verkeerde spoor dat dissipline hier sal geld.

'n Groot flater wat jagters soms begaan is om onafgerigte honde saam op jag te neem. Dit is fataal en ook baie ontrou teenoor sy eie span want baie sulke werfhonde is bloot haasjaers en bokvangers. Dit is te veel verwag dat sy honde sal agterbly as sulke brakke al blaffende en keffende agter 'n meerkat of bok aanstorm. Vir sy honde was dit in die eerste plek vreemd dat daar ander honde saamgaan, daarom sal dit nie buitengewoon voorkom dat ander goed behalwe jakkalse ook gejag mag word nie. Om dan hul baas nie in die skande te steek nie, storm hulle ook en die pak slae wat hulle dan kry, verstaan hulle hoegenaamd nie. So 'n span jakkalshonde verleer daar op een dag meer as wat hulle in maande geleer het. Dit kan ook gebeur dat 'n goed-afgerigte span sal weier om te werk en by die perd kom loop en hulle nie in die minste steur aan wat gebeur nie.

Dit is uiters noodsaaklik dat 'n span honde *net een baas* het en dat hy alleen bevele gee. Vir volwasse, geleerde honde wat in die veld gesout is, is inmenging van 'n tweede persoon minder verwarrend as vir die jong hond. Wanneer 'n jagmeester met sy span honde vir 'n klub jag, is hy in bevel en selfs die kaptein is onderhorig. Enige raad, indien nodig, moet aan die jagmeester gegee word en hy moet die bevele aan die honde oordra.

Die gebruik om honde gedurende die tydperk wanneer daar nie gejag word nie, onder klublede uit te loseer, bloot om onkoste te bespaar, is fataal. Dit is afbrekend aan die mate van saamhorigheid wat bestaan. Ook moet die hond 'n nuwe baas leer ken en op 'n nuwe werf speel hy met ander honde en leer miskien om hase te jag en meerkatte te vang. Alle dissipline is daarmee heen en wanneer hy weer terug is onder sy spanmaats, kan hy hulle weer allerhande kattekwaad leer. Die span honde moet saam in die hok bly en gereelde oefening kry gedurende sulke tydperke.

'n Volwasse hond, d.w.s. een wat ouer as twee jaar is en wat goed afgerig is, het geen verdere lesse om te leer nie en dit is dan die plig van die jagmeester om hom reg te gebruik. Ook moet die afrigter op hierdie stadium elke hond se eienaardighede, swakhede, tekortkominge, asook sy sterk punte, ken. Daar bestaan nie twee identiese honde nie en wanneer 'n jagmeester 'n nuwe span geleerde honde oorneem, is dit in die eerste plek sy plig om elkeen se indiwiduele eienskappe van naby te leer ken, en hy kan in hierdie verband baie van die vorige eienaar uitvind.

Hoe meer gedissiplineer 'n jakkalshond is, des te gevoeliger is hy vir enige pratery of rasery deur onverantwoordelike persone op 'n ongeleë tydstip. Persone wat aan die jag meedoen, moet hulle geheel onderwerp aan die bevele van die jagmeester.

game. The scent of the grey rhebuck is the most misleading of all South African game. Even trusty leaders can make mistakes here, but if they are well disciplined the huntsman can get them off the line by merely cracking his whip.

Any dog will charge after a hare or buck should it suddenly jump out in front of him, but a foxhound properly trained at an early stage will easily restrain himself when this happens. It is as important to observe discipline here as it is when the hound has wandered onto a wrong scent.

Huntsmen sometimes make the great mistake of taking untrained dogs with them on a hunt. This is fatal and also very unfair towards his own pack, for many such house dogs are nothing but chasers of hares and catchers of buck. His hounds cannot be expected to remain behind when such rioters charge after a meercat or buck, barking and yapping all the way. In the first place it will seem strange to his hounds that other dogs are taken with them, therefore it will not appear extraordinary that other things except jackals may also be chased. So as not to let their master down, they also charge and do not understand at all why they are subsequently whipped. Such a pack of foxhounds can then unlearn more in a day than they have learned in months. It is also possible that a well trained team will refuse to work and will come and trot near the horse, not taking the least notice of what is happening.

It is absolutely essential that a team of hounds should have *one master only* and that he alone should give commands. The interference of a second person is less confusing to adult, trained hounds that are accustomed to the veld, than to the young hound. When a huntsman hunts for a club with his pack of hounds, he is in command and even the captain is subordinate. Any advice, if necessary, must be given to the huntsman and he in turn must command the hounds.

The custom of walking hounds with club members during the off-season, merely for the purpose of economy, is fatal. It destroys whatever unity exists. What is more, the hound has to learn to know a new master, plays with other dogs in a new yard and perhaps learns to chase hares and catch meercats. Every vestige of discipline is lost and when he is back amongst his packmates he may then teach them all kinds of mischief. The pack of hounds should remain together in the run and should get regular exercise during such periods.

An adult hound, i.e. one that is more than two years of age and that has been well trained, has no further lessons to learn and it is the duty of the huntsman to use him correctly. The trainer should, at this stage, know the peculiarities, failings and shortcomings as well as the strong points of each hound. There are no two identical hounds in existence and when a huntsman takes over a new pack of trained hounds, it is his first duty to get to know thoroughly the individual characteristics of each one, and in this respect he can learn a great deal from the previous owner.

The more disciplined a foxhound is, the more sensitive he is to any talk or scolding by irresponsible persons at the wrong time. Persons taking part in the hunt should submit completely to the commands of the huntsman.

WENKE AAN DIE ONERVARE JAGMEESTER

deur D. E. Compion

ENIGE jagmeester wat 'n sukses van sy werk wil maak, sal die dag vroeg genoeg begin. Vroeg genoeg beteken hier wanneer hy in staat sal wees om die honde maklik te kan sien en volg en dit is gewoonlik met sonop. Om sodra die son uitkom te kan begin, vereis dus dat hy reeds voor dagbreek moes opgestaan, geëet, sy honde gelaai en tot by die plek waar die jag moet begin, gery het.

Voordat die jagmeester sy honde aflaai, moet hy eers 'n paar belangrike dinge vasstel:—

(1) Hoeveel vog (waterdamp) op die plantegroei en terrein is, omdat dit grootliks die werksvermoë van sy honde sal bepaal.
(2) Wat die aard van die vog is, nl. of dit slegs die lagie waterdamp wat die plantoppervalk aankleef is, of dit as dou of reëndruppels aanwesig is en ook of dit miskien in die vorm van ryp is. As plantegroei skaars of afwesig is, moet hy probeer vasstel of daar tog 'n bietjie klimaat in die grond is en of dit as nat of klam kan beskryf word, in teenstelling met 'n dorre oppervlakte.
(3) Die windrigting.
(4) Die geaardheid van die terrein, of dit vlaktes is of heuwels of berge, en ook of dit hard of sag vir die honde se pote sal wees.
(5) Watter soort weer verwag kan word, nl. winderig of stil, warm of koel, bewolk of oopgetrek, ens.

Elkeen van hierdie faktore speel so 'n belangrike rol in die sukses of mislukking van die dag se jag dat dit raadsaam is om oor elk verder uit te wei.

Die rol wat waterdamp vervul is 'n belangrike, want daarsonder kan die reuk van die jakkals nie bewaar en versprei word nie.

Die reuk wat die jakkals agterlaat, is na alle waarskynlikheid 'n stof wat uit sy voet- en velkliere afgeskei word en wat ook nie oplosbaar in water is nie. Dit is soos olie en sprei oor die oppervlakte van die water in 'n dun lagie met die gevolg dat, sodra die water verdamp, hierdie reukstof ook in die lug versprei word.

Na gelang van die hoeveelheid waterdamp in die lug, sal die vog en die reuk óf laag op die grond bly (en die hond sal sy neus op die grond moet hou) óf miskien sal dit 'n voet of twee bo die grond reik (en die hond sal dan met sy kop omhoog maklik op die spoor kan bly). Ook kan dit egter buite die bereik van die hond styg en die hele wêreld kan vir die man op die perd na jakkals ruik terwyl die hond nie die minste daarvan bewus is nie.

Hoe meer vog daar is, hoe meer sal die reuk wat die jakkals agterlaat, oor die water-oppervlak versprei en hoe meer sal dit in die lug waarneembaar word. Maar in teenstelling hiermee sal daar geen verdamping van die water wees wanneer hierdie vog in die vorm van ryp aanwesig is nie, en in so 'n geval sal die reuk ook nie kan versprei nie. Gevolglik sal dit beter wees om te wag dat die ryp eers moet smelt voordat met die jag begin word.

As daar 'n mate van beweging in die lug is en dit die damp, en daarmee die reuk, net effens van die spoor druk, sal die honde heel moontlik 'n paar

HINTS TO THE INEXPERIENCED HUNTSMAN

by D. E. Compion

ANY huntsman who wishes to make a success of his work, will start the day early enough. Here early enough means when he will be able to see and follow the hounds easily, and that is usually at sunrise. To be able to start at sunrise means that before daybreak he must get up, have breakfast, entruck his hounds and drive them to the place where the hunt is to start.

Before the huntsman lets his hounds out of the vehicle, he has to determine a few important things:—

(1) How much moisture (water vapour) there is on the vegetation and ground, since this will affect the working ability of his dogs to a large extent.

(2) What the nature of the moisture is, i.e. whether it is merely a film of water vapour clinging to the surface of the plants, or whether it is present as dew or raindrops, and also whether it may be in the form of frost. If there is little or no vegetation, he must try to determine if there is any moisture in the ground and whether it can be described as wet or damp as against an arid surface.

(3) The direction of the wind.

(4) The topography of the surroundings; whether there are plains, hills or mountains, and also whether the ground to be covered will be hard or easy on the feet of the hounds.

(5) What kind of weather can be expected, viz. windy or calm, warm or cool, cloudy or clear, etc.

Each one of these factors plays such an important part in the success or failure of the day's hunt, that a further discussion of each one is called for.

Water vapour plays a very important part, for without this the scent of the jackal cannot be preserved and diffused.

The scent which is left behind by a jackal is, in all probability, a secretion from his foot and skin glands, which is insoluble in water. It is like oil and spreads in a thin film over the surface of the water with the result that, as soon as the water evaporates, this scent is also diffused in the air.

According to the amount of water vapour in the air, the moisture and the scent will either remain low on the ground (and the hound will have to keep his nose to the ground) or may perhaps extend a foot or two above the ground (and the hound will be able to follow the scent easily holding his head up). It could also, however, rise beyond the reach of the

treë weg van die werklike spoor hardloop en tog in staat wees om die jakkals uiteindelik in te haal. Hier moet die jagmeester hulle nie op die spoor self probeer terugdwing nie.

Indien die beweging van die lug so sterk is dat dit as wind beskryf kan word, moet die jagmeester daarvan kennis neem, al is dit net 'n luggie. Hy moet dan ook dadelik die rigting daarvan bepaal. Wanneer die jag in die môre begin, het die jakkals reeds sy lêplek bereik of is hy taamlik haastig besig om dit wind-op te nader. As hy dus aan die wind-kant van die honde is, sal hy miskien besig wees om nog verder weg te beweeg, maar die honde sal reeds sy reuk waargeneem het as hy in die nabyheid is.

Indien die honde niks gewaar nie, moet die jagmeester dadelik besluit watter die waarskynlikste lêplek sal wees. Om dit te kan vasstel, moet hy die terrein eers deeglik bestudeer. 'n Jakkals soek altyd die hoogste plek uit om in die dag te rus, sodat hy sover moontlik kan sien indien gevaar vermoed word. In die winter sal hy aan die sonkant, beskut teen die wind, te vinde wees en in die somer aan die koeltekant, in die skaduwee van 'n struik of rots.

As die terrein 'n vlakte met lae hoogtetjies is, moet die hoogste bultjie versigtig wind-op genader word. As dit heuwelagtig is, moet die hange van die hoogste heuwels as die waarskynlikste lêplek beskou word. In berge sal die jakkals gewoonlik so hoog teen die hang gevind word as wat nodig is om oor die laagliggende gebiede te kyk.

Bosse en bosryke klowe is onwaarskynlike plekke om 'n jakkals in te kry. Enige plek met genoeg beskutting teen hitte of koue, na gelang van die seisoen, sal verkies word mits die uitsig nie belemmer is nie. Volwasse jakkalse word slegs met teeltyd in of naby gate gevind, of wanneer hulle daarin gedryf word wanneer die agtervolging te meedoënloos word.

'n Rooijakkals vang slegs met die hoogste uitsondering in die onmiddellike omgewing van sy boerplek. Hy sal eerder 'n hele paar myl verder vang en selfs tussen skape deurloop op sy pad terug, maar die gevaar is te groot dat hy dikgevreet by sy lêplek betrap kan word of dat oorblyfsels van die maaltyd sy lêplek kan verraai. Dit help dus om die honde te spaar as die jagmeester eers die waarskynlikste plek om die jakkals te soek, sal uitkies en sy span wind-op in daardie rigting neem.

Dit help oneindig baie as 'n jagmeester kan weet watter soort dag daar op hom wag en 'n bietjie fyn waarnemingsvermoë kan hom goed van pas kom. So bv. kan 'n stil nag met helder sterre, dou of ryp 'n mooi dag voorspel; of 'n tierende wind die vorige dag kan, na gelang sy rigting, 'n deinserige en lustelose of 'n warm en bewolkte dag beteken. Ou inwoners van 'n gebied is vir 'n nuweling altyd die beste bron van informasie.

Die aard van die dag sal die duur van die jag bepaal. Dit sou nie help om op 'n warm, winderige en allersinds onaangename dag aan te hou as dit nie geluk het om vroeg 'n spoor op te tel nie. Aan die anderkant kan die staking van 'n jag op 'n koel, bewolkte dag slegs deur die uithouvermoë van die jagter en sy span honde bepaal word. Dit is egter nie wenslik om later as 10 vm. nog verder spoor te soek nie, tensy dit miskien bewolk is, wanneer tot 1 nm. aangehou kan word.

Die geaardheid van die terrein is ook van groot belang, want 'n skurwe en harde oppervlakte sal selfs die hond met die beste pote baie verniel, terwyl 'n droë maar sagte of 'n klam en koel oppervlakte bydra tot die aanhouvermoë van die hond.

hound and the man on horseback may smell the jackal scent everywhere, while the hounds are not aware of it at all.

The more moisture there is, the more the scent left behind by the jackal will spread over the surface of the water, and the more perceptible it will be in the air. But on the contrary there will be no evaporation of the water when this moisture is present in the form of frost, and in this case the scent cannot be diffused either. Consequently it would be better to delay the start of the hunt until the frost has melted.

If there is a certain amount of movement of the air, driving the vapour, and with it the scent, very slightly off the trail, the hounds will probably run a few paces away from the actual trail and still be able, eventually, to overtake the jackal. In this case the huntsman should not try to force the hounds back onto the actual trail.

Should the movement of the air be strong enough to be described as wind, the huntsman should take this into consideration, even if it is only a slight breeze. He should then determine its direction immediately. When the hunt starts in the morning, the jackal will already have reached his lair, or he will hastily be approaching it upwind. Therefore, if he is on the windward side of the hounds he will perhaps be moving still further away, but the hounds will already have become aware of his scent if he is nearby.

If the hounds are not aware of anything, the huntsman should decide immediately what the most likely position of the lair is. To be able to do this he should first study the surroundings thoroughly. A jackal always looks for the highest spot to rest during the day, so that he can see as far as possible in case of danger. In winter he will be found on the sunny side, sheltered from the wind, and in summer on the shady side, in the shade of a bush or rock.

Should the surroundings be a plain with low rises, the highest rise should be carefully approached upwind. If the surroundings are hilly the slopes of the highest hills should be regarded as the most likely place. In the mountains the jackal will generally be found high enough up the slope to enable him to see out over low lying areas.

Bushes and wooded valleys are unlikely places in which to find a jackal. Any place with enough protection against heat or cold, according to the season, will be given preference provided the view is unobstructed. Adult jackals are found in or near holes during the breeding season only, or when they are driven there by unremitting pursuit.

It is highly exceptional for a Black-backed jackal to catch his prey in the immediate vicinity of his lair. He will sooner catch his prey a good many miles further and even walk in amongst sheep on his way back, but there is too much danger of his being trapped as he lies satiated in his lair, or of the remains of the meal betraying the position of his lair. It would thus help to spare the hounds if the huntsman were first to select the most likely spot in which to look for the jackal and then to take his pack in that direction upwind.

It is of great help if a huntsman can tell what kind of day is awaiting him and keen powers of observation could stand him in good stead. Thus,

'n Span honde vir jakkalsjag in Suid-Afrika bestaan gewoonlik uit agt jakkalshonde, twee foxterriers en een of twee windhonde. Die jakkalshonde is die spoorhonde; hulle soek totdat hulle die spoor kry en volg dit dan met die neus. Die foxterriers is daar om die jakkals wat in 'n gat vlug, uit te haal en die windhond sal, wanneer die jakkals gesien word, wegstorm om hom te vang of net te hinder totdat die jakkalshonde bykom om hom dood te byt. Dit is dus duidelik dat die jakkalshonde meer vryheid kry om te jag sodat hulle die spoor kan soek. Hulle bly om en voor die ruiter, maar hulle moet onder geen omstandighede gedwing word om agter die perd te loop nie. Die foxterriers en die windhond moet by die perd bly en hulle moet alleen op opdrag van die jagmeester handel.

Die jakkalshond moet nooit op die spoor gebring word nie, want in so 'n geval sal hy gou van sy baas afhanklik word en wag dat die jagmeester vir hom die spoor soek. Dit is die plig van die jagter om die honde in die moontlikste gebied te bring, bloot om sy tyd en sy honde te spaar, maar die honde moet dan jag om self die spoor op te tel.

Sodra die spoor deur 'n hond gevind is, sal hy dit al blaffende met sy neus volg. Die geblaf roep dadelik sy spanmaats en dan is die jag aan die gang. Die plig van die jagmeester is om dadelik vas te stel of dit 'n vars (warm) spoor is en of dit 'n ou een (koue) is. Hierin sal die windrigting hom help. 'n Warm spoor lei windaf want 'n jakkals vlug altyd windaf voor honde sodat hy altyd kan weet waar sy agtervolgers is. Met 'n warm spoor weet die jagmeester dan dadelik dat die jakkals nie te lank gelede nie nog in daardie gebied gelê of daar verbygedraf het. Die jakkals sal nie alleen windaf nie, maar ook altyd na die hoogste punt probeer weghardloop en in so 'n geval kan die jagter miskien gouer by sy honde kom deur kortpad soontoe te kies.

'n Koue spoor beteken een wat miskien 'n paar uur vantevore getrap is. Dit sal ook beteken dat die spoor nie ouer as agt uur is nie want 'n ouer spoor is onvolgbaar in Suid-Afrika. 'n Koue spoor lei wind-op en dit is heel waarskynlik gelaat toe die jakkals na sy lêplek terug is, wat miskien 'n hele paar myl verder aan sal wees. Maar ook hier moet die jagmeester die moontlikste lêplekke op die terrein kan uitkies sodat wanneer die honde in hulle ywer die spoor byster raak, hy hulle weer daarop kan terugbring deur in die rigting van die waarskynlikste lêplek te beweeg.

Dit is die plig van die jagmeester om, sodra sy honde die spoor vat, te sorg dat hy by sy span kom. Hy moet egter onder geen omstandighede tussen hulle in, of by hulle verby, jaag nie. As die jakkals so naby is dat hy hom kan sien, kan hy die windhond aan die wedren laat deelneem.

'n Rooijakkals sal nooit na laagliggende gebiede uitwyk nie. Hy sal oor bulte vlug, maar hy sal steeds na die hoogtes toe werk. As hy egter daaruit gedryf word, sal hy so gou moontlik oor die vlaktes probeer wegkom na die volgende heuwels.

'n Span honde moet sover moontlik in 'n klomp bymekaar wees as hulle op die spoor dryf. Honde wat by gebrek aan spoed agterbly deurdat die ander en die jagter nie vir hulle wag nie, word later skelm en steek lyf weg. Die jagmeester moet dus sy honde so probeer kies dat hulle min of meer ewe vinnig is, liewer òf 'n vinnige òf 'n stadige span, want as 'n hond uitsak beteken dit net dat hy nie kan byhou nie. In elk geval moet die jagmeester sorg dat sy honde gelyk wegkom.

for instance, a calm night with bright stars, dew or frost could forespell a clear day; or a raging wind the previous day could, according to its direction, mean a hazy and sultry or a warm and cloudy day. Old inhabitants of a region are always the best source of information to a new-comer.

The kind of day it turns out to be, will determine the duration of the hunt. It would be no use continuing the hunt on a hot, windy and in every respect unpleasant day, if a scent was not picked up early. On the other hand on a cool and cloudy day the discontinuance of the hunt will depend upon the powers of endurance of the huntsman and his pack of hounds. It is, however, not advisable to continue looking for scents after 10 a.m., except perhaps in cloudy weather when the hunt could continue until 1 p.m.

The nature of the ground is also of great importance, for a hard, rough surface will ruin even the hound with the best feet, whereas a dry but soft or a moist and cool surface will contribute greatly towards the hound's powers of endurance.

A pack of hounds for jackal hunting in South Africa generally consists of eight foxhounds, two foxterriers and one or two greyhounds. The foxhounds are the trackers; they search until they pick up the scent and then follow this with their noses. The foxterriers are there to get the jackal out when it has fled into a hole, and the greyhound will charge, as soon as the jackal is seen, to catch it or merely to worry it until the foxhounds have caught up to kill it. Thus it is clear that the foxhounds should be allowed more freedom to hunt so that they may find the scent. They remain around and in front of the rider, but on no condition must they be compelled to walk behind the horse. The foxterriers and the greyhound must remain close to the horse and they must act only in accordance with the commands of the huntsman.

The foxhound should never be brought onto the scent, for in this case he will soon become dependent on his master and will wait for the huntsman to find the scent for him. It is the duty of the huntsman to bring the dogs to the likely area, merely to save time and to spare his hounds, but then the hounds must be allowed to puzzle it out for themselves.

As soon as a hound has picked up the scent he will follow it with his nose, barking all the way. The barking immediately calls the rest of the pack and then the hunt is in full cry. It is the duty of the huntsman to determine immediately whether it is a burning scent or a poor one. Here the direction of the wind will help him. A fresh line always leads downwind for a jackal always flees downwind before hounds so that he can know where his pursuers are. When the scent is hot the huntsman knows immediately that not very long before the jackal was lying in or running through that area. Not only will the jackal flee downwind, but he will also always try to run to the highest point and in this case the huntsman may perhaps reach his hounds sooner by taking a short-cut there.

A poor scent means one that has been left perhaps a few hours before. It will also mean that the scent is not older than eight hours, for an older line cannot be followed in South Africa. A poor scent leads upwind, and was probably left by the jackal on his way back to his lair, which could be a couple of miles further. But here too the huntsman must be able to pick out the most likely spots in the surroundings where the jackal could be lying, so that when the hounds have to check due to their eagerness,

As honde besig is om 'n spoor, veral 'n koue spoor, uit te werk, moet hulle nie aangeja word nie. Die jagmeester kan help deur van die perd af te klim en probeer rigting gee, maar hulle moenie haastig gemaak word nie. Voordat die jagmeester probeer help, moet hy eers sorgvuldig die moontlikste rigting bepaal.

Dit kan gebeur dat twee jakkalse wat naby mekaar gelê het, se spore gelyktydig deur die honde opgetel word. Dit is dan die jagmeester se taak om onmiddellik vas te stel op watter spoor die swakste honde is en om hulle dan so taktvol moontlik van die spoor te probeer afdwing om by die sekerder honde aan te sluit. Hy kan hulle in so 'n geval met die perd probeer voorsny, maar hy moet hulle nie drasties probeer wegslaan of op hulle skreeu nie. As dit nie op 'n mooi manier kan geskied nie en hy het hulp by hom, moet hy sy geslelskap in twee verdeel en elke groep moet jaag om die honde te probeer inhaal.

As 'n jakkals geen verder uitkoms sien nie, sal hy in 'n gat vlug. In so 'n geval moet die jagmeester naby wees om die foxterriers die gat in te stuur. Party jakkalshonde gaan in gate, maar dit is ongewens omdat hulle al te dikwels daarin vassit. Die wenslikste is dat die jakkalshonde buite bly en alle openings toestaan en al blaffende die jakkals binnekant hou totdat die foxterriers kan bykom. Jakkalshonde leer gou genoeg wat hul rol by gate is en as hulle gevang en vasgehou word, of miskien met die sweep gekoppel word, sal hulle gou leer om nie in te gaan nie. Hulle moet egter nooit van 'n gat af weggeslaan word nie, want as dit gebeur, sal hulle die volgende keer wat hulle 'n jakkals in 'n gat jaag, terugdraai omdat hulle bang vir slae is.

By die gat. At the burrow.

Jakkalshonde wat in gate ingaan, kan as hulle uit die bedompige lug uitkom, baie maklik koue vat en allerhande kwale daarvan oorhou. Ook bly daar altyd die gevaar in gebiede met 'n hoë reënval dat daar onder in so 'n gat moerasgas kan versamel wat nie alleen die jakkals nie, maar ook die honde, sal verongeluk. Die gevaar van vassit is egter die kwellendste vir die jagmeester. Die langste wat so 'n hond in 'n gat vasgeknel gesit het en tog lewend daaruit gehaal is, is sover bekend 16 dae. Om 'n hond uit te grawe is tydrowende werk.

he can bring them back onto the line by moving in the direction of the most likely position of the lair.

It is the duty of the huntsman to see that he is with his pack the moment they are away on the line. He must not, however, under any circumstances, race in amongst them or past them. If the jackal is so close that it can be seen the greyhound may be allowed to take part in the race.

A Black-backed jackal will never flee to low lying areas. He will run over hillocks but he will always work his way to the heights. If, however, he is driven away from the heights he will try to cross the plains and reach the next hills as quickly as possible.

A pack of hounds should be kept together as far as possible when driving along a line. Hounds that are not fast enough and lag behind while the others and the huntsmen do not wait for them, eventually become rogues. The huntsman should select his hounds in such a way that they are more or less evenly matched for speed, rather having either a fast or a slow pack, for when a hound lags behind it only means that he is unable to keep up. In any case the huntsman must see that his hounds get away in a body.

When hounds are busy feeling for a scent, especially a poor one, they must not be hurried on. The huntsman may help by dismounting and by trying to lead them in the right direction, but they should never be hurried. Before the huntsman tries to help the hounds, he should first determine the most possible direction.

It is possible that two lines near to each other may be uncovered simultaneously. It is then the duty of the huntsman to establish immediately which one is followed by the poorer hounds and as tactfully as possible, try to head them off so that they may join the more sagacious hounds. In a case like this he may try to intercept them on his horse, but he should not try drastically to beat them off or shout at them. If this cannot be done quietly, he should divide his party in two and each group would race to try and catch up with the hounds.

When a jackal can find no other refuge, it will go to earth. In this case the huntsman must be nearby to send the foxterriers in. Some foxhounds go into burrows, but this is undesirable as they very often get stuck there. The best tactics are for the foxhounds to remain outside blocking all the openings and keeping the jackal inside by barking until the foxterriers can reach it. Foxhounds soon learn what they have to do at holes and, if they are caught and held or perhaps leashed they will soon learn not to enter. They should, however. never be beaten away from burrows, for if this should happen, they will turn back the next time they have run a jackal to earth because they will be afraid of being whipped.

Foxhounds that enter burrows may very easily catch cold when emerging from the stuffy air, and consequently develop various ailments. In areas with a high rainfall there is always the danger of an accumulation of marsh-gas at the bottom of such a burrow, which will kill not only the jackal but the hounds as well. The danger of getting stuck, however, is the most worrying to the huntsman. The longest time known during which a dog remained stuck in a burrow and was nevertheless taken out alive, is 16 days. To dig a hound out of an earth wastes a great deal of time.

As ’n jakkals in ’n gat vlug wat van so ’n aard is dat die foxterriers hom nie daaruit kan kry, of daarin kan doodbyt nie, moet hy uitgegrawe word en sodra hy uitkom, moet hy vir die honde oorgelaat word. Indien dit nie gedoen word nie, kan dit maklik gebeur dat die volgende keer wanneer ’n jakkals uit ’n gat gedryf word, die honde hom nie sal vang nie.

Indien op ’n gat met klein jakkalsies, wat nog nie vir hulself kan sorg nie, afgekom word, moet die jagmeester sy honde probeer wegkeer en hom eers toelê om die grotes te vang. Die ouers sal altyd in die buurt van die gat wees. Indien hulle die kleintjies na ’n ander skuilplek verwyder het, sal dit nie te ver van die oorspronklike een wees nie en hulle kan dus eers gevang word. Eers dan moet die jagmeester teruggaan om die kleintjies te vernietig.

Wanneer daar met ’n geslepe jakkals te doen gekry word, moet daar nie vir meer as twee of drie dae op hom jag gemaak word nie. Dit sal die honde se moed baie maklik breek. Dit is beter om eers ’n paar dae te wag en hom dan op ’n dag wanneer omstandighede baie gunstig is, weer aan te durf. Dit is baie waarskynlik dat hy dan vasgetrap sal word.

Dit gebeur soms net na die winter, selfs onder die gunstigste omstandighede dat die honde ’n jakkals ’n paar myl sal jaag en dan omdraai. In so ’n geval moet die jagmeester dadelik by wees om sy span aan te spoor, want as die honde sien dat hulle baas nie baie omgee nie, sal hulle dieselfde houding inneem en dit lei maklik tot die gewoonte om op ’n spoor om te draai.

As die jakkals gevang is, of dit nou op die oop veld of in ’n gat is, is dit noodsaaklik dat die jagmeester sy honde die kans sal gee om hom soveel te byt en te verniel as hulle wil. As hulle klaar het, kan die jagmeester wat oor is, saam terugneem of daar begrawe.

Met die terugtog moet die jagmeester op ’n stap ry en onder geen omstandighede probeer terugjaag huistoe nie. Sy span is dan moeg en dit is ook die tyd wanneer hy ’n punt daarvan moet maak om sy honde te prys. Dit kan hy nie genoeg doen nie en dit is baie bevorderlik vir die honde se moraal. Ingeval daar geen jakkals gekry is nie of waar hy ontkom het, is dit ewe noodsaaklik dat die jagmeester sy honde lof toeswaai. So ’n pad huistoe, na ’n harde dag se werk, is swaar vir die moeë en pootseer honde en as geen jakkals gevang is nie, is dit nog boonop verydelend. As die baas hulle egter prys, sal die sterte weer omhoog kom en hulle sal belangrik voel en die pad terug sal gladnie so vermoeiend wees nie.

’n Jagmeester wat uit die veld terugkeer moet nie eers vir homself sorg en die honde op die werf los en aan hulself oorlaat nie. Dit is ongelooflik watter skade so ’n span honde kan doen as hulle verveeld raak. Die honde moet eers versorg word, hul kos en water kry en in ’n behoorlike kamp gesit word. Hulle is honger en moeg en sal vir niks stuit om kos in die hande te kry nie. Honde sal slegs uit kampe breek as hulle honger het.

Indien honde in die veld agterbly, beteken dit net dat die jagmeester nie sy honde onder beheer gehad het nie en dat hy nie gesorg het dat hulle by hom bly nie. Dit is onverskoonbare nalatigheid.

Wanneer ’n nuwe jakkalshond deur ’n klub aangeskaf word, moet die jagmeester oppas om hom nie dadelik met die ander honde van sy span te vergelyk nie. Net soos ’n mens moet hy eers kans kry om homself te vind en by die nuwe omstandighede aan te pas, voordat hy na sy deugde geoordeel kan word. Dit geld net soveel wanneer ’n nuwe span aangekoop word.

If a jackal flees into a burrow of such a kind that the foxterriers cannot chase it out or kill it underground, it has to be dug out and, as soon as it emerges, the hounds must be left to do the rest. If this is not done it is very likely that next time the hounds will not want to catch a jackal when it emerges from a burrow.

If the huntsman discovers an earth containing jackal puppies which are not yet able to fend for themselves, he should try to hold his hounds and first concentrate on destroying the adults. The parents will always be in the vicinity of the burrow. If they have removed the puppies to a new hide-out, this will not be too far away from the original shelter and the parents can be dealt with first. Only then must the huntsman go back to destroy the puppies.

When the huntsman is dealing with a crafty jackal the hunt should not be continued for more than three days in succession. This could easily discourage the hounds. It is better to wait for a few days, and to resume the hunt on a day when conditions are very favourable. In all probability the jackal will then be caught.

It occasionally happens immediately after the winter, even under the most desirable conditions, that a pack will drive a few miles and then leave the line and turn back. In such a case it is essential that the huntsman should be with his pack to coax them on. If the hounds realise that their master is not very anxious to go on, they will adopt the same attitude and this may easily lead to the habit of backing out on a line.

When the jackal has been caught, whether on the open veld or in a burrow, it is essential that the huntsman should give his hounds the opportunity to bite and savage it as much as they wish. When they have finished the huntsman may take the remains back with him or bury them there.

On the way back the huntsman must steady his horse down to a walk and under no circumstances race home. The hounds are tired and this is the time when he must make a point of praising his pack. He cannot praise them enough and this boosts the hounds' morale greatly. If no jackal was found, or if it has escaped, it is equally essential that he should praise his pack. After a hard day's work the way home can be very arduous for the tired and footsore hounds and moreover, if no jackal has been caught, it can be very frustrating. If the master praises them, however, their tails will wag again, they will feel important and the way back will not be so exhausting after all.

On returning from the veld, a huntsman should not look after himself first and leave his hounds to their own devices in the yard. It is incredible how much damage such a pack can do when they become bored. The hounds should first be cared for, given water and food and put in a suitable enclosure. They are hungry and tired and nothing will stop them in their attempts to get food. Hounds will break out of camps only when they are hungry.

If any hounds remain behind in the veld, it only means that the huntsman did not have the proper control over his pack, and that he did not take the trouble to keep them with him. This is inexcusable carelessness.

When a new hound is acquired by a club, the huntsman must avoid comparing its capabilities with those of the members of his usual pack. Like a human being such a hound must first be allowed time to settle down

In sekere dele van Suid-Afrika maak boere nog baie gebruik van die kringtrek-metode van jag om die jakkals uit te roei. In so 'n geval word aanjaers en voorsitters só gebruik dat jakkalse in die bepaalde gebied na 'n punt gedryf word om dan daar vernietig te word. Indien 'n jagmeester na hierdie tipe jag genooi word, moet hy weier om met sy honde deel te neem. Vir hierdie soort jag word enige soort hond gebruik en sy span sal net bederf raak.

In die geval waar die jagmeester hulp moet aanvaar van persone wat gewillig is om te gaan voorsit, moet hy duidelike instruksies gee dat daar ten ene male nie met die werk van sy honde ingemeng mag word nie. As hulle 'n jakkals in die rigting van die voorsitters dryf, moet laasgenoemde nie sommer begin skiet of te perd tussen die honde injaag nie. Voorsitters moet die vlug van die jakkals in dié geval net op so 'n manier probeer dwarsboom dat hulle die honde help om hom gouer te vang. Sulke voorsitters moet altyd onderkant die wind posisie inneem.

In Suid-Afrika is jakkalsjag werk; dit is nie 'n dag van vermaak soos die jag van die vos in Engeland nie. Hoe gouer die jakkals gevang is, hoe gouer kan die honde huis-toe gaan om te rus. Daar is soms persone wat die jag vergesel wat nooit genoeg sal kry nie, maar hierin moet die jagmeester beslis wees. Om aan te hou op 'n dag wanneer alles teen die honde tel, is onbillik teenoor sy span wat hom vertrou. Al word daar ook wat van hom gesê, moet die jagmeester die moed hê om beleefd te weier.

Die jagmeester sal met allerhande soorte mense te doen kry. Daar sal altyd ongedissiplineerdes wees en ook altyd 'n paar beterweters. Daar sal dié wees wat, miskien as ampsdraers van die klub, ook tydens 'n jag bevele wil gee. Hy sal hulle op 'n mooi manier moet laat verstaan dat daar vir elke span honde en op elke jag *net een jagmeester* is.

Gelukkig is die regte jagmetode vinnig besig om pos te vat en kan daar op die samewerking van die groot meerderheid staatgemaak word. 'n Aangename jag is vir die jagmeester en sy span 'n plesier. Jakkalshonde hou van hul werk: hoe meer, hoe beter en dit is noodsaaklik dat die jagmeester sy honde fyn moet dophou sodat een of meer van die flukstes hulle nie ooreis nie. Vir 'n baas is die liefde en vertroue van sy span 'n plesier, maar vir die hond is die lojaliteit van die baas alles.

AANHANGSEL I.

Die volgende aanhalings kom uit: „Foxhounds and their Handling", deur Lord Henry Bentick:—

. . . Sodra 'n span Jakkalshonde hul jagmeester leer ken het en ook geleer het om in hom te glo, is hulle nooit gelukkig as hulle nie naby hom is nie en daar is niks wat hulle nie sal doen, of poging wat hulle nie sal aanwend om na hom terug te kom nie.

. . . Jy kan hulle nie *ongestraf bedrieg* nie.

. . . Jakkalshonde moet soos vrouens behandel word: Hulle verdra nie om *afgeknou*, *bedrieg* of *verwaarloos* te word nie en hulle sal dit nie ongestraf laat verbygaan nie.

. . . Daar is geen sekerder toets vir die vaardigheid van 'n jagmeester as die *reaksie* van sy span honde en die manier waarop hulle met *lus* vir hom sal *werk* nie.

. . . Ek het dikwels gesê dat dit makliker is om 'n goeie Eerste Minister as 'n goeie jagmeester te kry en die hemel weet albei is moeilik genoeg.

. . . Moet nooit die honde help voordat hulle om hulp vra nie.

. . . Hoe kouer die spoor, hoe meer tyd moet die honde kry om dit uit te werk.

. . . Dit is die bederf van 'n span honde om in te meng voordat hulle self tou opgegooi het.

. . Indien daar gedurig ingemeng word wanneer honde spoorsny, sal hulle gou leer om by enige moeilike plek te wag totdat die jagmeester kom help.

. . . Vir die *een* keer wat die jagmeester kan help, is daar *negentien* kere wat die honde vir hulself moet help.

and become acclimatised before it can be expected to show its virtues. The above is also essentially true if a whole new pack is bought.

In certain parts of South Africa farmers still frequently use the encircling method of hunting to destroy the jackal. In a case like this beaters and waylayers are used in such a way that jackals in that particular area are driven to a certain point where they are destroyed. If a huntsman is invited to this type of hunt, he should refuse to participate with his pack. Any breed of dog is used for this type of hunt and his pack will only get spoilt.

In cases where the huntsman has to accept the assistance of persons who are willing to act as waylayers, he must give explicit instructions that on no account should anyone interfere with the work of his hounds. When a jackal is driven in the direction of the ambush, the waylayers should not just start shooting or race in amongst the hounds on their horses. In a case like this waylayers should try to obstruct the jackal in such a way as to help the hounds to catch it sooner. Such waylayers should always take up position downwind.

Jackal hunting in South Africa is work; it is not a day's entertainment like fox-hunting in England. The sooner the jackal is caught, the sooner the hounds can go home to rest. Sometimes there are people who join the hunt who can never have enough, but here the huntsman must be firm. To continue on a day when everything is unfavourable for the hounds, is unfair towards his pack who trust him. In spite of any remarks made about him, the huntsman must have the courage to refuse politely.

The huntsman will have to deal with all kinds of people. There will always be undisciplined ones and also a few who always know better. There will be those who, possibly as officials of the club, will also want to give commands during a hunt. It must be made clear to them that for each pack of hounds and on each hunt there can be *only one master of the hounds.*

Fortunately the correct method of hunting is rapidly becoming established and the huntsman can depend upon the co-operation of the great majority. A pleasant hunt is enjoyable to the master and to his pack. Foxhounds enjoy their work; the more, the better and it is essential that the master should watch his hounds carefully to see that one or more of the most diligent ones do not overwork themselves. The love and confidence of his pack is a pleasure to a master, but the loyalty of his master is everything to a hound.

APPENDIX I.

The following quotations are taken from "Foxhounds and their Handling", by Lord Henry Bentinck:—

> . . . once a pack of hounds have learnt to know, and believe in, their huntsman, they are never happy away from him, and there is nothing they won't do, and no effort they won't take, to get back to him.
> . . . you cannot *lie* to them with *impunity.*
> . . . Hounds should be treated like women: that they would not bear to be *bullied,* to be *deceived,* or *neglected* with impunity.
> . . . There is no more certain test of the capacity of a huntsman than the manner in which his hounds *fly* to him and *work* for him with a *will.*
> . . . I have often said it was easier to find a good Prime Minister than a real good huntsman, and heaven knows that either is difficult enough.
> . . . don't go to help your hounds till they ask you, . . .
> . . . the worse the scent, the more time the hounds want to puzzle it out.
> . . . it was ruinous to a pack of hounds to meddle with them before they had done trying for themselves.

. . . As die jagmeester die honde altyd agter die perd hou, sal viervyfdes van die *beste honde* net daar bly en *nie probeer om spoor te sny nie*.

. . . Dit is onmoontlik om die skade te oorskat wat 'n span honde aangedoen word indien hulle *onverdiend* en *gereeld* in die veld agtergelaat word: Dit *leer hulle om lyf weg te steek*.

. . . Dit is onmoontlik om die *skade* te oorskat wat 'n span honde aangedoen word, deur hulle onversorg op die werf te laat uitbly; dit leer hulle om allerhande kattekwaad aan te vang.

. . . Sy grootste skande is eerstens om sy honde oor die hele veld gesaai te hê en om van hulle te laat agterbly.

. . . 'n Vos onder die regte omstandighede opgejaag is klaar gevang.

. . . Die wegneem van die vos se kop. Geen optrede kan meer afkeurenswaardig of veragtelik wees nie. 'n Klein hondjie wat dit eenmaal onder sy maats uitgespook het en die kop triomfantelik voor die span uitgedra het, SAL NOOIT WEER NA 'N HAAS KYK NIE: hy is van daardie dag af 'n pure jaghond en het homself as 'n toekomstige TEELHOND uitgewys.

Die vertalings van bogaande aanhalings is vir sover dit moontlik was, by Suid-Afrikaanse omstandighede aangepas. Kursiverings is volgens die oorspronklike outeur.

AANHANGSEL 2.

DIE FUNKSIE VAN KLUBLEDE WAT AAN 'N JAKKALSJAG DEELNEEM.

Wanneer 'n klublid aan 'n jakkalsjag deelneem, ry hy in werklikheid net vir sy eie plesier saam, hy het *geen* funksie nie, maar hy kan nuttig wees, indien hy gevra word om:—

(1) Die terrein te beskryf indien dit vir die jagmeester onbekend is.
(2) Te gaan voorstaan as dit wenslik is.
(3) Te help met die uitgrawe, indien 'n jakkals in 'n gat gevlug het.
(4) Te help deur drade te knip, te laat sak, te herstel, of om hekke oop en toe te maak.
(5) Te help indien 'n hond dalk seerkry.

So 'n klublid moet egter *nooit*:—

(1) Dwing om altyd net by die jagmeester te wil wees nie, omdat hy nie alleen die jagmeester se aandag nie, maar ook dié van die honde aftrek.
(2) *Tussen die honde injaag as hulle op 'n spoor is nie.*
(3) Raas, hard gesels of gedurig met sy sweep klap nie.
(4) Met 'n vuurwapen op die voortvlugtende jakkals skiet nie.
(5) Sy eie onafgerigte honde saambring nie.
(6) Beterweet en die jagmeester probeer raadgee oor sy honde nie.
(7) As hy aangesê is om die jag by te woon, 'n Naturelle-arbeider in sy plek stuur nie.
(8) *Eevele aan die span honde probeer gee nie.*

'n Klublid moet onthou dat hy *op die jag onder die bevel van die jagmeester staan* en dit geld vir sowel die kaptein en bestuurslid as vir die gewone lid.

Indien 'n lid besluit om aan 'n jag deel te neem, moet hy sorg dat hy **BETYDS** is.

. . . If the hounds are habitually checked, and meddled with in their natural casts, they will learn to stand still at every difficulty, and wait for their huntsman.

. . . For *once* the huntsman can help them, *nineteen* times the hounds must help themselves.

. . . When the huntsman trails his hounds behind him, four-fifths of his *best hounds* will be *staring at his horse's tail, doing nothing*.

. . . It is impossible to over-estimate the mischief done to a pack of hounds by *unfairly* and *habitually* leaving a hound out of its place: it is *teaching them to be rogues*.

. . . It is impossible to over-rate the *mischief* done to a pack of hounds by leaving them out; it teaches them every sort of *vice*, . . .

. . . His greatest disgrace is, first, to have his hounds squandered all over the country, and to leave them out, . . .

. . . A fox *nicely found is half killed*.

. . . Taking the fox's head away from the hounds. No practice can be more abominable or more cockney. A puppy that has once fought for the head and carried it home in triumph, trotting in front of the hounds. will NEVER LOOK AT A HARE AGAIN; he is made from that day, and marks himself for a STALLION HOUND.

APPENDIX 2.

THE FUNCTION OF A CLUB-MEMBER ATTENDING A HUNT.

If a club-member attends a hunt, he is going along for his own pleasure and actually has *no* function whatever, but he can be very useful if asked to:—

(1) Describe the terrain if this is unfamiliar to the huntsman.
(2) Be a member of an ambush.
(3) To help with the digging out of a jackal which has gone to earth.
(4) To help with the cutting, lowering or repairing of fences, or to open or close gates.
(5) To help if a hound gets hurt.

Such a club-member must *never*:—

(1) Be insistent to be near the huntsman, because this will not only distract the the huntsman's attention, but also disturb the hounds.
(2) *Charge in amongst the hounds when they are driving on the line.*
(3) Bluster, talk loudly or crack his whip continually.
(4) Shoot at a fleeing jackal.
(5) Bring along his own untrained dogs.
(6) Be pedantic and try to advise the huntsman on the use of hounds.
(7) If notified to attend the hunt, send a Native labourer as a substitute.
(8) *Try to command the pack of hounds.*

A club-member must remember that *during the hunt he is under the command of the huntsman*, and this is true for the captain, office bearer and ordinary member alike.

If a member decides to attend a hunt, he must see to it that he is PUNCTUAL.

VOEDING

DIE voeding van 'n hond begin reeds voor sy geboorte want, soos alle soogdierembrios, verg die ontwikkelende hondjie voeding direk van sy ma en is hy op daardie stadium 'n eersterangse parasiet. As die teef dan nie die nodige voedingstowwe kry nie, sal weefsels en been van haar eie liggaam afgebreek word om die nodige aan die ontwikkelende kiem te verskaf. Dit is dus duidelik dat die gewone voeding van 'n dragtige teef nie alleen in haar eie behoeftes moet voorsien nie, maar ook van so 'n aard moet wees dat dit ook in die behoeftes van die embrios sal voorsien.

Aangesien liggaamweefsels tot 'n groot mate uit die elemente koolstof, waterstof, stikstof, suurstof, fosfor en swawel, asook tot 'n mindere mate uit magnesium, kalsium, yster, kalium en 'n aantal spoorelemente soos chloor, sink, koper, mangaan en jodium opgebou is, is dit noodsaaklik dat die voedsel wat aan die teef gevoer word, hierdie elemente moet bevat en wel in maklikverteerbare verbindings, daar dit d.m.v. die bloedstroom na die embrios vervoer moet word.

Die standaard hondekos in Suid-Afrika, nl. mieliepap en vleis, is dus nie voldoende nie, selfs ook nie met 'n ruime toevoeging van vars melk nie. Dit is noodsaaklik om dit aan te vul met kosstowwe wat ryk aan verteerbare eiwitte en oplosbare kalk is.

Mieliepap word as basiese voedsel om ekonomiese redes gevoer, maar daar moet onthou word dat dit hittegewend is en dat dit dikwels in warm weer huidontsteking veroorsaak. Ook kan dit hardlywigheid veroorsaak, tot so 'n mate dat die agterlyf verlam raak. Sonder byvoeding is mieliepap heeltemal onvoldoende.

Soos te verwag is van enige dier wat aan 'n knaende kwaal ly, kan dit gebeur dat 'n dragtige teef nie 'n groot eetlus sal hê nie, maar dit is belangrik dat sy voldoende sal vreet. Dit is dus noodsaaklik dat die kos smaaklik voorberei sal wees sodat sy lus sal hê om te vreet.

Kosstowwe wat algemeen gebruik word vir die verryking van die rantsoen by honde is vismeel, lewertraan, moutekstrak en dikalsiumfosfaat.

Vismeel is 'n maklik-verteerbare en goedkoop kossoort, wat belangrike vitamines bevat. Dit kan nie vleis in die dieet vervang nie, want vleis bevat meer van die belangrike vesel wat noodsaaklik vir die spysverteringsproses is, maar dit kan vir 'n aansienlike tyd sonder slegte gevolge gebruik word. Die waarde van vismeel hier lê in die verryking van die gewone rantsoen, mits dit nie meer as 15 persent daarvan uitmaak nie.

Lewertraan bevat vitamine A en D. Dit emulsifiseer maklik en word vinnig in die spysverteringskanaal opgeneem. Een teelepelvol per dag, met die rantsoen gemeng, is meer as voldoende.

Moutekstrak is die bron van koolhidraat, ook in 'n maklik-verteerbare vorm. Die hoofbron van die suikers is natuurlik die mieliepap, maar dit verteer stadiger. Mieliemeel bevat egter net soos vleis, ru-materiaal wat ook 'n belangrike rol by die verteringsproses speel. Een ons moutekstrak per dag, gemeng met die rantsoen is genoeg om die voedsel te verryk.

FEEDING

THE feeding of a hound already starts prior to its birth because, as in the case with all mammal embryos, the developing puppy draws food directly from the maternal body and at that stage is nothing but a first-rate parasite. If the bitch is not given the correct diet, tissue and bone will be absorbed from her own body to supply the developing foetus. It is clear, therefore that the feeding of the pregnant bitch must be of such a nature that it is not only sufficient for the needs of the bitch, but also for those of the developing embryos.

Because body tissues are chiefly composed of the elements carbon, hydrogen, nitrogen, oxygen, phosphorus and sulphur and to a lesser extent of magnesium, calcium, iron, potassium, and a number of trace elements such as chlorine, zinc, copper, manganese and iodine, it is essential that the food which is fed to the bitch, should contain these elements in easily digestible compounds, because these must be transmitted via the circulatory system to the embryos.

The standard diet for hounds in South Africa, viz. mealie-meal porridge and meat, is therefore not sufficient, not even with a liberal addition of fresh milk. It is essential to enrich this with substances containing large amounts of digestible vitamins, as well as calcium in a soluble form. Mealie-meal porridge is used as a staple food for economic reasons, but it must be remembered that it generates heat and may cause skin eruptions during hot weather. It can also cause constipation to such an extent that the hindquarters become paralised. Without additional foods mealie-meal porridge is totally inadequate.

As can be expected from any animal suffering from a chronic disease, it may be that a pregnant bitch will lack appetite, but it is important that she should ingest enough food. It is essential, therefore, that the food should be appetising.

Food substances generally used to enrich the normal ration of hounds are fishmeal, codliver oil, malt extract and dicalcuim phosphate.

Fishmeal is an easily digestable and economic food which contains important vitamins. It cannot displace meat in the diet, as the latter contains more of the important roughage which is essential in the process of digestion, but it can be used for a considerable time without detrimental effects. The value of fishmeal lies wholly in the enrichment of the normal ration, on condition that it does not exceed 15 per cent thereof.

Codliver oil contains vitamins A and D. It emulsifies easily and is rapidly absorbed by the alimentary canal. One teaspoonful per day, mixed with the ration, is more than sufficient.

Extract of malt is a source of carbohydrates, also in easily digestible form. The main source of the sugars, however, is the mealie-meal porridge, but the latter is digested at a slower rate. Mealie-meal, however, like meat, contains roughage which is an important aid in the digestive proccss. One ounce of malt extract per day, mixed into the ration, is enough to enrich the food.

Dikalsiumfosfaat is 'n verbinding wat kalsium en fosfor in 'n maklikopneembare vorm bevat. Hierdie twee elemente is noodsaaklik in die opbou van been maar slegs 'n halwe teelepel per dag oor die kos gestrooi is voldoende. As hierdie twee elemente nie in die voedsel van die teef aanwesig is nie, sal been uit haar eie liggaam opgelos word om in die behoeftes van die ontwikkelende embrios te voorsien, wat natuurlik 'n baie ongewenste toestand is.

Kook verander gewoonlik die samestelling van voedsels en dit is dus noodsaaklik dat die vleis, wat vir 'n dragtige teef gaar gemaak word, nie doodgekook moet word nie. Die vleis en mieliepap word apart voorberei en nadat dit afgekoel het, word dit gemeng. Net voordat dit gevoer word, word die addisionele voedingstowwe bygevoeg en ingeroer.

Kort voor die tyd kom om te werp, sal die teef nie meer wil vreet nie. Dan moet gesorg word dat daar genoeg skoon, vars water byderhand sal wees. Terwyl sy werp en tot drie dae daarna sal die teef haar maar min aan kos steur, maar daar moet, sonder om haar te veel te steur, genoeg vars kos binne bereik geplaas word. Ou kos, wat sy nie wou vreet nie, moet verwyder en weggegooi word.

'n Teef het agt spene en al werp sy ook al watter getal, bv 'n jakkalshond dikwels tot veertien, is dit wenslik dat sy nie meer as agt grootmaak nie en dit is nog beter as sy net ses behou. Die swakstes kan gou uitgeken word, want hulle word deur die sterkeres verdring. Hulle moet dan liewer weggeneem en vernietig word. Dit gebeur ook dat die hondjies wat eerste gebore word, swakker in die wêreld kom as dié wat later gebore word, of soms word party soveel later as die eerstes gebore dat hulle 'n te groot agterstand het om in te haal. Dit is dan vir die teler om te besluit wat hy wil doen.

Die samestelling van die rantsoen van die sogende teef bly dieselfde as toe sy nog dragtig was, maar dit moet na gelang die kleintjies ontwikkel, vermeerder word. Die toestand van die klein hondjies is die beste maatstaf waarvolgens geoordeel kan word. As hulle klaerig en rusteloos is en ook nie vinnig genoeg ontwikkel nie, ly hulle honger, terwyl as hulle stil en rustig slaap en vinnig groei, beteken dit dat die teef vir hulle genoeg melk het.

Vanaf die sesde week begin die teef hulle speen, maar dit kan ook gebeur dat hulle voor dié tyd haar spene al so seer en stukkend gebyt het, dat sy hulle ontydig wil speen. Sy moet dus goed dopgehou word en as die vreetlustiges haar te veel seermaak, moet sy van hulle geskei word en net ingelaat word om hulle te laat drink. Haar spene kan, as dit nodig is, met soutwater en brandspiritus behandel word om hulle hard genoeg te kry.

Om met die speenproses te help, kan die kleintjies gemaalde rouvleis kry om te vreet en hulle kan ook geleer word om vars koeimelk uit 'n bak te drink. Die waarde van vars melk by sowel klein as groot honde kan nie oorskat word nie. Dit bevat baie van die noodsaaklike voedingstowwe.

Gedurende die speenproses is dit noodsaaklik om hulle goed dop te hou, want party is gulsige vreters en ander is fyn eters. Laasgenoemdes kan maklik uitgeken word en dit is noodsaaklik dat die ander van die kos af weggehou word totdat die fyn vreters eers 'n bietjie kans gekry het.

Reeds op hierdie stadium moet die klein hondjies hul eerste lesse geleer word. Selfs die gulsigste een onder die span kan geleer word om terug te staan totdat hy geroep word om te kom vreet. As hy reeds hier by die kosbak gedissiplineer word, is sy toekomstige afrigting soveel makliker.

Dicalcium phosphate is a compound containing both calcium and phosphorus in easily digestible forms. Both these elements are essential in the building of bone tissue, but half a teaspoonful only per day, strewn over the food, is necessary. If these two elements are absent from the diet of the bitch, bone of her own body will be re-absorbed to supply the needs of the developing embryos. This condition is highly undesirable.

Cooking changes the composition of the foods and it is, therefore, essential that meat prepared for a pregnant bitch should be underdone. The meat and the porridge are prepared separately and mixed after being cooled. Just before feeding, the additional foods are stirred in.

Just prior to whelping a bitch will refuse to eat. She should then be supplied with enough clean, fresh water, within easy reach. While whelping and for up to three days afterwards, she will have little interest in food, but without disturbing her too much, fresh food should be left regularly within reach. Stale food which has been refused, must be removed and disposed of.

A bitch has eight mammae and even if the litter exceeds this number, in a foxhound often as many as fourteen, it is desirable that she should raise only eight, and it is even better for her to retain only six pups. The weaker ones can be recognised easily because they are ousted by the stronger pups. It is better that the former be removed and destroyed. It may be that the first-born pups are weaker than those whelped later or sometimes some are born after such a long interval, that they fail to hold their own against the first-born pups. ~~The breeder must then~~ make his selection.

The composition of the diet of the suckling bitch remains as before whelping, but the quantities must be increased in accordance with the development of the pups. The condition of the litter is the best standard by which to judge. If the pups are peevish and restless, and their development appears retarded, they are suffering from lack of food, while on the contrary, if they are quiet and sleep restfully, show normal growth, it may be assumed that the bitch has enough milk for them.

From the sixth week the weaning process starts, but sometimes the mammae of the bitch may be so painfully savaged by the pups' sharp teeth, that she tries to wean them prematurely. She must therefore be watched carefully and, if the gluttons hurt her too much, separated from them and be allowed to suckle them only at fixed times. The teats, if necessary, may be treated with a strong saline solution and/or methylated spirits to harden the surfaces.

To assist the weaning process, the pups may be fed raw minced meat and they can be trained to drink fresh cow milk from a bowl. The value of fresh milk for young, as well as adult hounds, cannot be over-emphasised for this contains several of the essential foods.

During weaning it is necessary to watch the pups carefully, for some are gluttons while others are delicate feeders. The latter are easily recognisable and it is essential that the others should be restrained until they have started feeding.

Already at this stage the puppies must be taught their first lessons. Even the most greedy of the litter can be taught to wait until summoned to eat. If it has already been disciplined at the food trough, its future training will be so much easier.

Geen hond, en allermins 'n klein hondjie, kan 'n begrip van 'n klomp woorde vorm nie. Hoe eenvoudiger die taal en hoe minder die aantal woorde wat hy moet leer, hoe gouer sal hy verstaan. Dieselfde woorde moet altyd vir dieselfde of soortgelyke bevele gebruik word. Gewoonlik word die woord „ terug " gebruik wanneer die kosbak ingebring word en hulle moet dan terugstaan tot die volgende bevel gegee word. Enige vrypostigheid moet vinnig en vasberade, maar nie onnodig venynig nie, ontmoedig word. Sodra almal terugstaan, volg die tweede bevel met die woordjie „ haak " en hulle kan dan kom vreet.

„Terug " " Back "

Klein hondjies by die speenoud-stadium is gewoonlik onderhewig aan inwendige parasitiese wurms, wat groot ongerief en selfs die dood veroorsaak. Die hondjies groei nie goed nie en raak boepens. Die wurms of stukke daarvan word soms in die mis uitgeskei. Dit is iets wat maklik verhelp kan word want daar is uitstekende preparate in die handel om daarteen te gebruik.

Gebreksiektes is nog 'n ander groot kwelling in die teelhok. Hulle ontstaan as gevolg van gebrek aan sekere essensiële voedingstowwe in die rantsoen. Dit is wenslik dat dit verhoed word deur 'n gebalanseerde rantsoen te voer, en dit kan gelukkig maklik reggemaak word.

Gemaalde rouvleis en skoongemaakte binnegoed, veral die pens en lewer, is uitstekende afweermiddels teen gebreksiektes. Dit is egter ewe noodsaaklik dat die hondjies genoeg ruimte kry om te baljaar, want sonlig is ook noodsaaklik. Misvormde voor- en agterbene is altyd 'n teken van 'n gebreksiekte en dat die hok miskien te bekrompe is. Gereelde oefening en goeie voedsel kan dit egter verhelp, mits die misvorming nie reeds te ver ontwikkel het nie.

Die lewe van die klein hondjie bestaan uit vreet, speel en slaap; hy moet kans kry om hom gedaan te baljaar, maar beide die vreet en die speel moet in sy afrigtingsproses gebruik word. Onvoldoende groei by 'n jong hond is gewoonlik alleen te wyte aan verwaarlosing en dit beteken gebrek aan kos,

No dog, and certainly not a pup, can grasp the meaning of a number of words. The simpler the language and the less the number of words used, the sooner the meaning will be understood. The same words must always be used for similar or related commands. Usually the word " back " is used when the food trough is brought to the kennel and the hounds must wait until the next command is given. Any unruliness must be dealt with immediately and firmly, but not unnecessarily vindictively. When all are well back the next command is given with the word " get ", indicating to them to come and feed.

" Get " „ Haak "

Puppies at the weaning stage are generally subject to infections of internal parasitic worms, causing great discomfort and sometimes even proving fatal. The pups do not grow properly and become pot-bellied. The whole or segments of these worms are sometimes passed out with the faeces. This condition can easily be remedied for there are several excellent patent medicines which can be used.

Deficiency diseases are also vexatious problems in the breeding kennels. These arise as a result of the lack of certain essential food substances in the diet. It is desirable to prevent this by providing a balanced ration and can fortunately be easily remedied. Raw minced meat and cleaned viscera, especially the stomach and liver, are excellent preventatives for deficiency diseases.

The pups must have enough room to play and sunshine is also a necessity. Deformed fore and hind legs are always signs of a deficiency disease and that the run is probably too cramped. Regular exercise and good food will, however, prevent this, provided that the deformity is not too far advanced.

The life of a pup consists of gorging itself, playing and sleeping. It must be able to play until exhausted, but both the feeding and the playing must be utilised in the process of training. Insufficient growth of a young hound is usually due only to neglect and this means lack of food, attention and proper

aandag en behoorlike huisvesting. ’n Jakkalshond moet nie vet gevoer word nie; dit is amper net so ’n misdryf soos te min kos; hy moet lenig gebou wees. Dit sal beteken dat elke hond persoonlike aandag moet geniet. Daardie persoonlike aandag is vir die hond net soveel werd soos sy kos en sy huisvesting.

Soos reeds genoem, bestaan die gewone rantsoen van die jakkalshond in Suid-Afrika uit mieliepap en vleis. In Engeland is dit hawermeelpap en vleis. Die pap en vleis word apart gaargemaak en as dit behoorlik afgekoel is, word dit gemeng en gevoer. Die vleis word eers van die bene verwyder en in kleiner stukkies gesny voordat dit gemeng word. Die sous uit die vleispot word bygevoeg om dit ’n bietjie smaakliker te maak, maar dit moet nie die mengsel in ’n pappery verander nie. By beide die vleis en die pap moet sout gevoeg word as dit gaargemaak word.

Daar word algemeen aangeneem, en met reg ook, dat rouvleis die beste vir die hond is, maar volgens die aard van die werk van die jakkslshond is dit beter dat hy gaar vleis gevoer word. Al rou vleis en bloed wat hy moet proe, is dié van die jakkals.

Wat ook al gevoer word, dit is absoluut noodsaaklik dat die kos koud sal wees. Warm kos belemmer die hond se ruikvermoë en as daarmee volgehou word, sal so ’n hond later baie min op ’n spoor beteken.

Jakkalshonde moet van kleinsaf saam vreet en ’n eenvoudige houttrog is die beste voerbak. Soos reeds by die klein hondjies genoem, moet die swak vreters eers ’n kans kry om by die bak te kom, anders sal die gulsiges hulle eenvoudig verdring en hulle sal nie genoeg kry nie. Ook is dissipline hier vir die groot honde noodsaaklik, en ’n goedafgerigte hond kan hier uitgeken word.

Groente is ’n wenslike item in die dieet van ’n hond. Die voorbereiding is baie eenvoudig, want die verskillende soorte word net opgekap, stingels, lowwe, blare en al, en saam in een pot gaar gekook. Wortels, rape, kool, beet, uie, aartappels en boontjies kan gebruik word. As dit deeglik sag en fyn maar nie „ dood ” gekook is, word die sous van die vleispot bygevoeg, en gekapte murgbene kan ook reg aan die begin ingesit word om dit kragtiger te maak. Hierdie groentesop neem die plek van gras wat so dikwels deur honde gevreet word.

Donkies en afgeleefde perde is die goedkoopste bron van vleis vir ’n span honde. Die vleis is voedsaam en kan maklik van die groot bene verwyder word. Ten alle tye moet vermy word om klein beenstukkies te voer. Beenstukkies word gewoonlik gesluk sonder dat dit behoorlik fyn gekou word, met die gevolg dat die hond verstop raak.

Groot bene, waarvan die honde nie stukkies sal kan afbyt nie, kan vir die honde gegee word mits daar iemand staan om bakleiery te keer. Klein beentjies en beensplinters kan in die spysverteringskanaal dwars draai en groot ongerief veroorsaak.

Honde gee nie om as vleis al ’n bietjie sleg begin word nie, maar dit is baie onaangenaam vir die persoon wat dit moet voorberei. Dit is dus nodig om ’n eenvoudige waterverkoelde kamertjie te bou wat net groot genoeg sal wees om die donkiekarkas te hou.

Kookgeriewe kan ook maar eenvoudig wees. Groot genoeg kafferpotte kan gebruik word, maar dit is dikwels ’n vermorsing van brandhout. Daar-

kennel facilities. A foxhound must not be overfed so that it becomes overweight; this is as grave an error as under-feeding for the hound must have lithe build. This implies that each hound must receive personal attention, which means as much to a hound as its food and kenneling.

As already mentioned, the regular ration of the foxhound in South Africa consists of mealie-meal porridge and meat. In England the ration is oatmeal porridge and meat. The porridge and the meat are prepared separately and, when these have been sufficiently cooled, mixed and fed to the hounds. The bones are first removed from the cooked meat which is then chopped up before being mixed with the porridge. The gravy from the meatpot is added to make the mixture more palatable, but care must be taken not to give it a slushy consistency. To both meat and porridge, salt must be added while being prepared.

It is generally correctly accepted that raw meat is the best for a dog, but on account of the nature of the work of the foxhound, it is better that it should be fed cooked meat. The only raw meat and blood the hound must taste, must be those of the jackal.

Whatever is fed to the hound, it is absolutely essential that it must be cold. Warm food spoils the sense of smell and, if given regularly, will make the hound of little use in the field.

Hounds must feed together from puppyhood and a simple wooden trough is the best container. As in the case of the pups, the delicate eaters among the adult hounds must be allowed to feed first before the gluttons are allowed to approach. If not, the former will simply be ousted without getting enough food. Discipline at the food trough is essential for adult hounds and a well-trained one can easily be recognised here.

Vegetables are desirable items in the diet of the hound. The preparation is very easy, as the different kinds are simply cut up, stems and foliage as well and the lot cooked in the same boiler. Carrots, turnips, cabbage, beetroot, onions, potatoes and green beans are used. When these have been properly cooked, but not overdone, gravy from the meat pot can be added, and chopped marrow bones can be added at the outset to improve the value. This vegetable hash is a substitute for grass, which is commonly eaten by dogs.

Donkeys and aged horses are the most economic sources of meat for a pack of hounds. The meat is nourishing and can be removed easily from the large bones. Bone splinters should never be fed to hounds. These are swallowed without being properly masticated and cause constipation. Large bones which cannot be splintered, may be given to the hounds on condition that somebody remains with them to stop any fighting. Small bones and bone slivers may become lodged in the alimentary canal and cause great discomfort.

Hounds are not particular about meat which is already turning putrid, but this is very unpleasant for the responsible person to work with and it is, therefore, necessary to build a simple water-cooled room just large enough to hold a donkey carcass.

The cooking can also be very simple. Large tripod pots may be used but for these too much firewood is required. For this reason it is a saving to

om is dit 'n besparing om kommandopotte aan te skaf, want dié het 'n vuurmaakplek wat vermorsing uitskakel.

Aangesien volwasse honde slegs eenkeer per dag, maar jonges en kleintjies meer dikwels kos kry, is dit noodsaaklik dat die kokery vroeg in die more sal begin, sodat die kos genoeg kans kan kry om af te koel. Deurgekapte oliekonkas dien uitstekend as houers om die kos in koud te maak.

Hoe en waar ook al gekook word, is dit noodsaaklik dat daar sindelik gewerk word. Dit is die plek waar vlieë die kans kry om hul siektekieme te versprei, veral as daar met vleis en vars melk gewerk word.

Die algemene toestand van die hond sal sy voeding verraai. As sy hare glad en blink, sy oë helder en intelligent en sy geaardheid lewenslustig is, kan aangeneem word dat ook die voeding reg en voldoende is. As, in teenstelling, sy hare kroes en glansloos is, sy oë dof en uitdrukkingloos en hy self lusteloos en verpot voorkom, is daar fout met die voeding.

'n Hond se eetlus moet nooit as maatstaf by sy voeding gebruik word nie. Die lustige vreter sal hom ooreet en vet en lui word, terwyl die fyn vreter onnodig maer sal bly. Daar moet gestreef word om die hond se liggaamsbou stewig maar ook lenig te hou en dit kan geskied deur die regte hoeveelheid en soort kos te voer.

invest in commando pots, which are each fitted with its own fireplace to eliminate waste.

Considering that adult hounds are fed only once per day, but that the young ones and the puppies are fed more often, it is essential that the cooking should start early in the morning so that there will be sufficient time for the food to cool properly. Halved oil-drums are good containers to use for cooling.

It is immaterial where and how the food is prepared, but it is essential that it should be done hygienically. The cook-house is generally the place where fly contamination takes place, especially in meat and milk.

The general condition of the hound will bear witness of its feeding. If the coat is smooth and glossy, the eyes bright and intelligent and the disposition lively, it can be assumed that the hound's diet is correct. If, however, the coat is ruffled and dull, the eyes lack lustre and the hound itself appears listless and unhealthy, wrong feeding is the most probable cause.

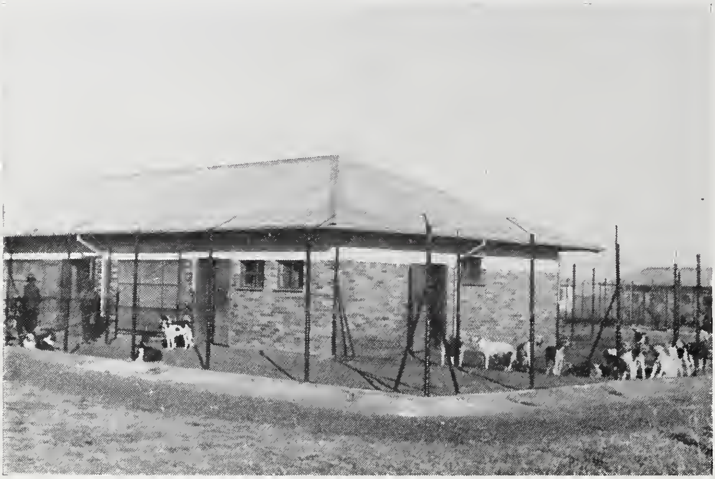
The appetite of the hound must never be used as a standard when feeding. The glutton is inclined to overfeed and become fat and lazy, while the delicate feeder will remain unnecessarily lean. It is essential to strive to get the hound's condition firm, but at the same time lithe and this can only be achieved by providing a correct, balanced diet.

HUISVESTING

JAKKALSHONDE kan nie soos ander honde los op die plaaswerf rondloop nie. Daarvoor is hulle veels te lewenslustig en as hulle vir een oomblik verveeld sou raak, is daar geen einde aan die stoutighede wat hulle sal aanvang nie.

Hulle kan ook nie sommer in enige ou kampie opgehok word nie want waar daar 'n sagte plekkie is, sal hulle deurgrawe. Dit is noodsaaklik, terwille van hul pote, dat die kamp 'n grondvloer sal hê maar daarom moet die draad onder baie goed geanker wees.

Ewe belangrik as 'n stewige kamp, is 'n goedopgerigte slaapvertrek wat 'n deur in die kamp het sodat die honde vrylik uit en in kan beweeg.



'n Hondehok by die S.A. Lombard-Natuurreservaat.

A dog kennel at the S.A. Lombard Nature Reserve.

Belugting van die slaaphok moet van so 'n aard wees dat die honde nooit in 'n trek sal kan lê as die deur toe is nie. 'n Trekkerige kamer sal net onnodige kwale bevorder. Dit is ook baie wenslik dat dit 'n baksteengeboutjie moet wees aangesien sink- en ander opslag-geboutjies onderhewig is aan 'n te groot wisseling van temperatuur, wat nadelig vir die honde is.

Die vloer van die kamer moet van sement wees en dit, sowel as die mure, moet glad afgewerk wees sodat die kamer ontsmet en skoongehou kan word.

Die kamer moet met 'n lae baksteenmuurtjie van omtrent 10 duim hoog op die vloer in twee verdeel word. Vir die agterste gedeelte, wat as slaapplek gaan dien, moet 'n plank-platvorm gemaak word wat los pas sodat dit uitgehaal en afgeskrop kan word. Indien nodig, kan die slaapplank in seksies gemaak word sodat dit maklik hanteerbaar is.

HOUSING

FOXHOUNDS cannot be allowed to roam around at large in the farmyard like other dogs, as they are far too lively and should they become bored for a moment, there is no end to the mischief they may do.

They can also not be confined to any little enclosure, for they will burrow their way out where the ground is soft. It is essential for the sake of their feet, that the camp should have an earth floor, but the fencing around it should be very firmly anchored.

As important as a sturdy enclosure is a well-built kennel with a door leading into the run so that the hounds may move in and out freely.

The kennel should be ventilated in such a manner that the hounds will not be able to lie in a draught when the door is closed. A draughty room will only be conducive of unnecessary ailments. It is also most desirable that the building should be of brick since iron buildings and other crudely erected structures are subject to too large a range of temperature, which is harmful to the dogs.

The floor of the room should be of concrete and it, as well as the walls, should have a smooth finish so that the room can be disinfected and kept clean.

The room should be divided in two by a low brick wall standing about 10 inches high above floor level. A loosely fitting wooden platform which can be removed and scrubbed down, should be made for the back portion which is to serve as the sleeping place. If necessary the sleeping board can be made in sections so that it can be handled easily.

In winter it is necessary to supply the dogs with bedding. Grass or straw is quite adequate. When settling down a foxhound will scratch up his bedding so as to lie surrounded by grass, but on the floor, and therefore a wooden floor is necessary, otherwise the hound will find itself lying on the cold concrete. The low wall will prevent the bedding from falling off the wooden platform and becoming littered over the whole room.

In order to economise on maintenance costs, hounds are sometimes sent out to be cared for by the various club members. This practice may be more economical, but it is very destructive of the solidarity and esprit de corps of the pack of hounds. If at all possible this practice should be avoided.

It is obviously difficult for a club which has already invested a considerable sum in the purchase of a pack of hounds, still to invest an additional sum in the building of suitable housing. With proper co-operation, however, this item could be cheaper than estimated. The members must do the work themselves and purchase the material only.

A pack of eight foxhounds, a greyhound or two and two foxterriers will have plenty of room in an enclosure 30 by 20 feet, and a kennel 12 by 12 feet will be more than large enough. The wire fencing should be eight feet high and should be provided with an overhanging verandah since there are foxhounds that can jump and clamber over an ordinary fence.

In die winter is dit nodig om die honde van kooigoed te voorsien. Gras of strooi is heeltemal voldoende. 'n Jakkalshond sal hom inwoel sodat hy tussen die gras, maar op die vloer, sal lê en dit is daarom dat 'n plankvloer nodig is, anders sal hy op die koue sement te lande kom. Die lae muurtjie verhoed dat die kooigoed van die plankplatvorm sal afval en die hele vertrek vol lê.

Dit gebeur, met die oog op besparing van onderhoudskoste, dat honde onder die verskillende klublede uitgedeel word om te versorg. Dit is miskien meer ekononies, maar dit is baie afbrekend aan die onderlinge saamhorigheid en die spangees van die honde. Indien enigsins moontlik, moet hierdie gebruik vermy word.

Dit is vanselfsprekend moeilik vir 'n klub wat reeds 'n aansienlike bedrag in die aankoop van 'n span honde belê het, om nog verder geld te bestee vir die aanbou van behoorlike huisvesting. Hierdie probleem kan egter met behoorlike samewerking 'n goedkoper item wees as waarvoor beraam is Dit is nodig dat die lede self die werk sal doen en slegs die materiaal aankoop.

'n Span van agt jakkalshonde, 'n windhond of twee en twee foxterriers het heeltemal genoeg ruimte in 'n kamp van 30 by 20 voet en die slaapvertrek van 12 by 12 voet is oor groot genoeg. Die kampdrade moet agt voet hoog wees en van 'n oorhangende veranda voorsien word, want daar is jakkalshonde wat oor 'n gewone draad spring en klouter.

Die geboutjie hoef ook nie hoër mure as agt voet te hê nie en dit kan van 'n platdak voorsien word mits daar goeie ventilasie onmiddellik onder die dak is.

As die fondse dit sou toelaat, is dit wenslik om dadelik met die bou van 'n drie-kamer geboutjie te begin. Aan die slaapvertrek moet 'n eenvoudige kombuisie met 'n ruim genoeg pakkamer wees. As die finansies van die klub nie alles onmiddellik kan dra nie, moet die enkelkamer geboutjie so beplan word dat daar op 'n later geleentheid aangebou kan word. Klublede moet daarvan bewus wees dat as 'n medelid gewillig is om die honde op sy werf te huisves en hy nog hulle versorging en afrigting moet onderneem, dit te veel gevra word dat hy nog bergruimte moet afstaan vir die honde se meel asook vir 'n kookplek.

Indien dit enigsins bekostig kan word, lewer 'n vierkamergebou die gewenste toestand: die arbeider wat gehuur word om met die versorging van die honde te help, moet naby die hok woon om veral in die nag enige bakleiery stop te sit. Dit is egter aan die luukse kant en dit is miskien beter om die kamp liewer nagenoeg aan die volkshuisies te bou. Dit is heeltemal ongewens, as die arbeider getroud is, dat sy hele huisgesin heeldag om die hok moet wees. As hy egter ongetroud is, is dit 'n makliker saak.

Dit is goedkoop om slegs twee groot kafferpotte aan te skaf en buite agter 'n skerm te kook, maar die ondervinding het geleer dat kommandopotte, met hul ingeboude vuurmaakplekke, meer as die helfte brandhout en steenkool bespaar. As die stofies dan verder binnenshuis opgestel word, is die verbruik nog aansienlik minder. Op reëndae is 'n buite-kokery baie onbevredigend. Die kombuis moet ook dien as pakplek vir die voerbakke en as wasplek. 'n Wasbak kan van stene en sement gebou word en die skottelgoedwater kan in 'n gewone grondriool gelei word. Daar is niks meer onaangenaams as om heeldag 'n klomp vuil, vetterige water buite uit te gooi nie. Dit is dan ook hoogs noodsaaklik dat water na die hokke aangelê

The walls of the kennel need not be more than eight feet in height and the building could have a flat roof, provided there is good ventilation immediately underneath the roof.

If there are sufficient funds it is advisable to start erecting a small three-roomed building immediately. There should be a simple kitchen with an adequately large storeroom adjoining the kennel. If all this expense cannot immediately be financed out of club funds, the single-roomed building should be planned in such a way that extensions can be added at a later stage. Club members should realise that, if a fellow member is willing to house the hounds in his yard and if he has to care for them and train them as well, it would be too much to expect of him to provide storage for the hounds' mealie-meal as well as a kitchen.

A four-roomed building, if the club can afford it, is ideal; the labourer hired to assist in the care of the hounds must live near the kennel to stop any fights, especially during the night. This, however, is rather a luxury and it would perhaps be better to build the camp close enough to the native labourers' huts. If the labourer is married, it is most undesirable for his whole family to be around the kennel all day. If he is unmarried, it is a much easier matter.

It would be inexpensive merely to buy two large kaffir pots and to cook out of doors behind a shelter, but experience has proved that commando pots with their built-in fireplaces reduce the consumption of the firewood and coal by more than half. Moreover, if these little stoves are installed indoors the consumption is reduced even more considerably. On rainy days cooking out of doors is very unsatisfactory. The kitchen should also serve as a store room for the food dishes and as a scullery. The sink may be built of brick and cement and the dishwater may be run off into an ordinary French drain. When dirty, greasy water is thrown out all day, nothing can be more unpleasant. It is also essentail that water be laid on to the kennel with at least two taps, i.e. one at the door of the kennel where the hounds' drinking trough should stand, and one in the kitchen.

Club members should realise that the member who is willing to take the pack of foxhounds on his farm, benefits in one respect only, and that is that the hounds will be available immediately should the jackal have made a catch during the night. Furthermore, they should realise that he has made a sacrifice for the sake of his club, and it is incumbent on his fellow members to make his task an easy one. In the first place the club should assist the person by housing the hounds as well as possible.

The advisability of the addition of a small cold-storage room for the keeping of meat was discussed under the chapter on feeding. It is a very cheap but also very essential item. Water must be laid on to this room as well but, since the room can be erected within a few yards of the building, this will not be an expensive undertaking.

A concrete slab on which a donkey may be slaughtered, can be laid next to the cold-storage room, with a furrow draining into the French drain. This slab can then be washed down thoroughly and the surroundings of the kennel can be kept in a hygienic condition.

The store-room should be equipped with a cupboard in which all the medicine and other requirements for the treatment of sick hounds can be kept. Since the store-room also has to be used for the storage of the mealie-meal, it

moet word, met tenminste twee krane, nl., een by die slaapvertrek se deur, waar die honde se waterbak dan ook moet staan, en een in die kombuis.

Klublede moet besef dat daar vir dié lid wat gewillig is om die span jakkalshonde op sy plaas te neem, net een voordeel is en dit is dat as die jakkals die nag gevang het, die honde onmiddellik tot sy beskikking sal wees. Verder dat dit 'n opoffering terwille van sy klub is en dit van sy medelede sal afhang om sy taak 'n maklike te maak. In die eerste plek moet die persoon dan tegemoet gekom word deur die honde so deeglik moontlik te huisves.

Onder die hoofstuk oor voeding is die wenslikheid van die aanbou van 'n koelkamertjie, vir die bewaring van vleis, bespreek. Dit is 'n baie goedkoop maar ewe noodsaaklike item. Ook hierheen moet water aangelê word, maar aangesien dit slegs enkele treë van die gebou opgerig kan word, is dit nie 'n duur onderneming nie. Langs die koelkamertjie kan 'n betonstrook gegooi word waarop die donkie geslag kan word, met 'n sloot wat ook in die grondriool dreineer. Hierdie plaat kan dan deeglik afgespeol word en die omgewing van die hondehok kan sindelik gehou word.

In die pakkamer moet 'n kas aangebring word waar al die medisyne en ander benodighede vir die behandeling van siek honde bewaar kan word. Aangesien die pakkamer ook vir die berging van die mieliemeel moet dien, is 'n digsluitende kas noodsaaklik. Die kombuis sal te warm wees om die klein aptekie te huisves.

Indien die klub ook besluit om sy eie honde te teel, sal verdere hokke noodsaaklik wees. Tenminste een afsonderingshok, waar loops tewe apart gehou kan word, is nodig en dan sal 'n tweede, waar die teef kan werp, ook benodig word. 'n Hele aantal loops tewe kan in die een afsonderingshok gehou word, maar 'n teef wat moet werp, moet alleen in 'n hok gelaat word.

Of die hele saak van teling die moeite werd sal wees, sal die lede self moet besluit. Daar bestaan reeds teelstasies in twee Provinsies, vanwaar honde teen 'n redelike prys aangekoop sal kan word en daar word ook teelstasies in ander Provinsies beplan.

Beide die bestaande teelstasies sal slegs gesteriliseerde honde verskaf en dit sal beteken dat teelhonde spesiaal aangekoop sal moet word. Maar die voordeel van die honde wat van die Provinsiale teelsentrums af kom, is dat hulle reeds afgerig is en ook nie meer die spesiale aandag wat 'n klein jakkalshondjie verg, nodig het nie.

Nog 'n saak wat die aandag nodig het by die uitlê van klubhokke, is die aanplant van geskikte soort bladwisselende bome. Koelte is noodsaaklik op die kampe en indien die kamer nie ruim genoeg is nie, moet tydelike koelte met behulp van sparre aangebring word. Gedurende die wintermaande is son weer baie welkom, daarom moet bome gebruik word wat hulle blare sal verloor.

Die kampdrade wat, soos reeds genoem, stewig moet wees, sal voortdurend aandag vra. Dit is noodsaaklik om te weet dat, as die honde gereeld teen die draad urineer, dit baie gou deurroes. Om dit te verhoed moet die drade tot so hoog hulle sal kan bykom, beskerm word deur dit te verf. Die beste middel hiervoor is 'n teerproduk wat onder andere ook in dieretuine gebruik word om die hokdrade mee te beskerm. Hierdie stof is in die handel verkrygbaar, maar by gebrek daaraan sal 'n dik laag gewone verf goed wees. Gewone gegalvaniseerde draad is nie bestand teen urine nie.

Die deur in die hondehok moet ook baie goed beskerm word. Die honde kan nie die versoeking weerstaan om daaraan te kou nie en dit geld

is essential that the cupboard should have well-fitting doors. The kitchen would be too hot for the housing of a small dispensary.

Should the club decide to breed its own hounds, additional kennels will be required. At least one isolation kennel where bitches on heat may be kept apart, and a second one, where the bitch may litter, are required. Quite a number of bitches on heat may be kept in the same isolation kennel, but a bitch due to litter should have a kennel to itself.

The members themselves will have to decide whether the whole matter of breeding is worth while. There are breeding stations—from which hounds can be purchased at a reasonable price—in two provinces already, and breedings stations are being planned in the other provinces.

Both the existing breeding stations sell sterilised hounds only and this means that breeding-hounds will have to be purchased specially. But the advantage in getting hounds from the provincial breeding centres is that they are already trained and will no longer require the special attention which a foxhound puppy needs.

Another matter requiring attention when planning the layout of the club kennels is the planting of suitable varieties of deciduous trees. Shade is essential in the enclosures and, if the kennel is not spacious enough, temporary shade must be provided by means of slats. During the winter months, on the other hand, the sun will be very welcome, therefore trees that shed their leaves should be planted.

The fence of the enclosure which, as stated above, should be sturdy, will require constant attention. It is essential to know that the fence will rust very quickly if the hounds constantly urinate against it. To prevent this the the fence should be protected by painting the wires up to such height as would be within reach of the hounds. The best material for this purpose is a tar product which is used, amongst other things, for the protection of cage wires in zoos. This material is obtainable on the market but, failing this, a thick coat of ordinary paint will be effective. Ordinary galvanised wire is not resistant to corrosion by urine.

The kennel door must also be very well protected. The hounds cannot resist the temptation to gnaw it and this applies to the door frame as well. It is thus essential that the lower portion of the door—up to the height of three feet—and the frame be covered with smooth galvanised iron.

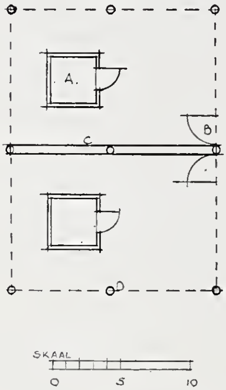
The windows too require special attention. Foxhounds are very inquisitive and when they are in the room, they will want to look out of the windows. As they will usually put their feet against the windows, these should be protected by firm wire-netting. The mesh of the wire-netting should be not more than one inch in diameter, but the ordinary light type of wire used for bird cages would not be of much use here, since it would very soon be trampled to pieces. It is therefore necessary to get the diamond mesh type of wire-netting and also to see that the windows of the sleeping quarters are placed as high as possible. These windows must be of a type that can be opened and shut, therefore the wire-netting is essential.

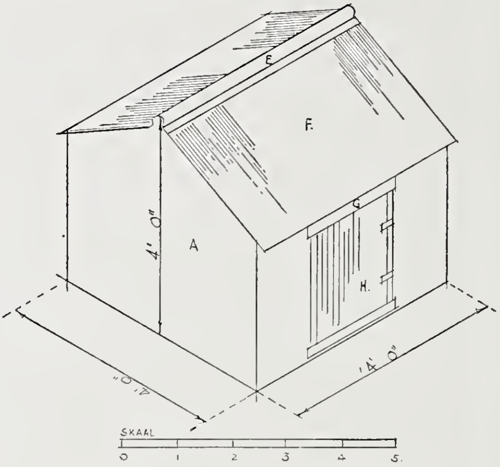
Sick hounds must be isolated, especially before a definite diagnosis has been made, since the disease could be infectious. A small enclosure with a solidly constructed, draught-free kennel is necessary for this purpose. A stout box or a small brick kennel may be used. If possible this little enclosure should be some distance away from the main enclosure.

ook vir die kosyn. Dit is dus noodsaaklik om die onderste drie voet van die deur en kosyn met gladde sink oor te trek.

Ook die vensters vra spesiale aandag. Jakkalshonde is baie nuuskieirg en as hulle in die kamer is, sal hulle deur die vensters wil kyk. Omdat hulle dan gewoonlik met hul pote daarteen sal druk, is dit noodsaaklik om dit met stewige draad te beskerm. Die ogies van die draad moet hoogstens een duim in deurnsit wees, maar die gewone ligte draad wat vir voëlhokke gebruik word, beteken hier nie veel nie want dit word baie gou stukkendgetrap. Dit is dus nodig om die swaar tipe te kry en ook te sorg dat die slaapvertrek se vensters so hoog moontlik ingebou word. Hierdie vensters moet oop- en toegemaak kan word, daarom is dit nodig dat die draad aangebring word.

Dit is nodig om siek honde af te sonder, veral as die diagnose nog nie definitief is nie, want dit mag aansteeklik wees. Hiervoor is 'n klein kampie met 'n stewige, trekvrye slaaphokkie nodig. 'n Stewige kas of 'n klein baksteenhokkie kan vir die doel gebruik word. Indien moontlik, moet hierdie kampie 'n hele ent van die algemene hok wees.





Skets van slaaphok.—Sketch of kennel.

Uitlegplan van twee teelhokke of afsonderingshokke.

A = Slaaphok.
B = Hek (2′ × 8′).
C = Baksteenmuurtjie, 3′ hoog.
D = Kamppale.
E = Vors.
F = Sinkdakkie.
G = Kosyn.
H = Houtdeurtjie waarvan die rande met gladde sink versterk is (1½′ × 2′).
I = Beton.

Grootte van kamp = 10′ × 15′.

Grootte van slaaphok = 4′ × 4′ × 4′.

Kampdrade 8′ hoog plus veranda.

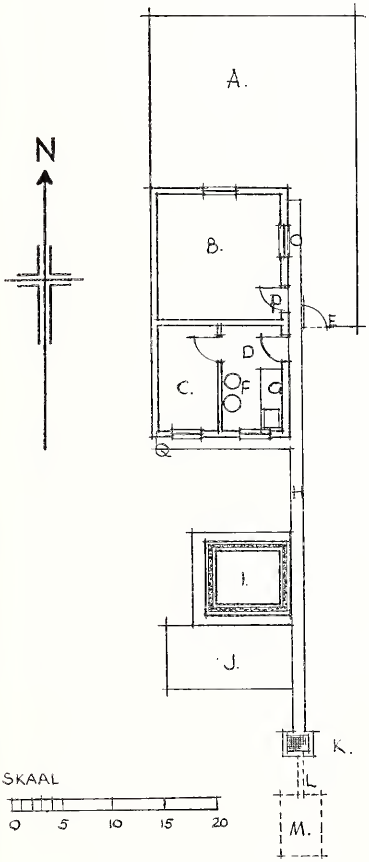
Layout of two breeding kennels or isolation kennels.

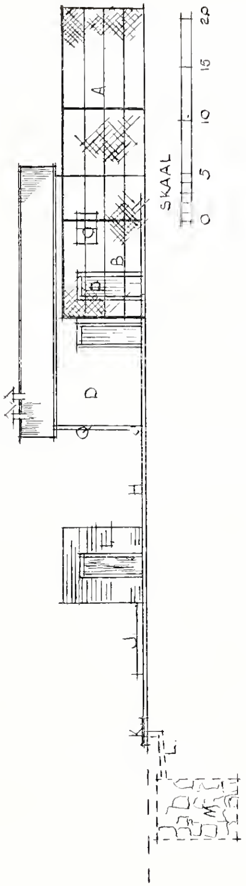
A = Kennel.
B = Gate (2′ × 8′).
C = Low brick wall, 3′ in height.
D = Fencing posts.
E = Ridging.
F = Corrugated iron roof.
G = Door frame.
H = Small wooden door with edges reinforced by smooth galvanised iron (1½′ × 2′).
I = Concrete.

Size of enclosure = 10′ × 15′.

Size of kennel = 4′ × 4′ × 4′.

Fencing of enclosure 8′ in height plus veranda.





Aansig van oostekant.
East Elevation.

A = Kamp (20′ × 30′).
B = Slaapkamer (12′ × 12′).
C = Pakkamer (10′ × 6′).
D = Kombuis (10′ × 6′).
E = Hek (2′ × 8′).
F = Kommandopot (±10 gel.).
G = Wasbak en tafel.
H = Oop sementvoortjie.
I = Koelkamertjie (5′ × 6′ × 8′).
J = Slagplek (6′ × 12′).
K = Sif waar riool begin.
L = Erdepyp na riool.
M = Grondriool (4′ × 6′ × 8′).
O = Staalvensters (3′ × 2′).
P = Deur (2′ 6″ × 6′ 6″) waarvan onderste 3′ met gladde sink oorgetrek is, vir hondekamer.
Q = Dakgeut se afleipyp.

A = Enclosure (20′ × 30′).
B = Sleeping quarters (12′ × 12′).
C = Store-room (10′ × 6′).
D = Kitchen (10′ × 6′).
E = Gate (2′ × 8′).
F = Commando pot (± 10 gallons).
G = Sink and drain-board.
H = Open concrete furrow.
I = Small cold-storage room (5′ × 6′ × 8′).
J = Slaughtering place (6′ × 12′).
K = Grate at beginning of drain.
L = Earthenware pipe leading to drain.
M = French drain (4′ × 6′ × 8′).
O = Steel windows (3′ × 2′).
P = Door (2′ 6″ × 6′ 6″) of kennel. Lower 3′ of door to be covered with smooth galvanised iron.
Q = Down pipe of roof gutter.

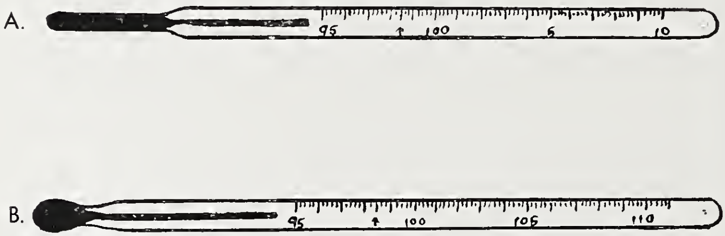
'N PAAR GEWONE SIEKTES VAN HONDE, HUL DIAGNOSE EN BEHANDELING

deur F. J. Veldman, B.V.Sc.

'N HOND toon gewoonlik gou genoeg wanneer daar iets met hom verkeerd is, en simptome soos lusteloosheid, swak of geen eetlus, vermering, hoes, ens., kan gewoonlik baie maklik opgemerk word.

Alhoewel daar talle aansteeklike siektes van honde bekend is en nog meer siektes van die verskillende organe kan voorkom, is die diagnose van die moeilikheid selfs vir die ervare veearts soms onmoontlik. Ten spyte daarvan is daar tog sekere siektetoestande wat baie meer algemeen voorkom en waarvan baie selfs deur die leek gediagnoseer kan word, as hy net in die saak sou belangstel en hom daarop sou toelê.

Siektes word gewoonlik in twee groot groepe verdeel, nl. dié wat 'n koorsreaksie by die dier laat ontstaan en dié wat dit nie doen nie. Daarom is dit altyd wenslik om in die eerste plek te bepaal of 'n siek hond ook 'n hoë koors het of nie. Die temperatuur van 'n hond kan alleen met 'n termometer bepaal word; op geen ander manier nie. Daar steek geen waarheid in die ou geloof dat 'n hond 'n hoë koors het wanneer sy neus droog is of dat hy geen koors het as sy neus klam is nie. Die temperatuur van 'n hond word geneem deur 'n gewone termometer ongeveer twee duim in die anus in te stoot. Deur die termometer met seep, vaselien of 'n dun olie te smeer, gly dit makliker in die anus in. Gewoonlik word dit een tot twee minute in die anus gelaat en daarna word die lesing geneem. Vir honde kan 'n gewone kliniese termometer gebruik word maar die rektumtermometer, met 'n kort dik kwikbal, is tog meer geskik omdat dit nie so maklik breek nie.



A = Kliniese termometer.
B = Rektum-termometer.
A = Clinical Thermometer.
B = Rectal Thermometer.

Die normale temperatuur van volwasse honde wissel van 101 tot 102 grade Fahrenheit; by jong hondjies selfs tot 103. Tog word dit deur verskillende toestande be-invloed, bv. die môre-temperatuur is altyd laer as die aand-temperatuur, oefening laat gewoonlik die temperatuur styg, ens. Daarom kan 'n mens nie te veel waarde heg aan 'n aand-temperatuur van 103 grade nie, terwyl dieselfde temperatuur in die môre tog veel kan beteken. 'n Mens moet dus altyd die heersende temperatuur buitekant die liggaam in aanmerking neem en in die gedagte hiervoor sekere geringe toelatings maak.

A FEW COMMON DISEASES OF DOGS, THEIR DIAGNOSIS AND TREATMENT

by F. J. Veldman, B.V.Sc.

A DOG usually shows promptly enough when something is wrong and such symptoms as listlessness, poor appetite or loss of appetite, vomiting, coughing, etc., can usually be detected easily.

Although there are numerous infectious diseases of dogs and still more diseases which can affect the various organs, the diagnosis of the trouble is sometimes difficult for even an experienced veterinary surgeon. In spite of this there are certain diseases which are more common and some of these can be diagnosed by the layman if he is sufficiently interested.

Diseases are usually divided into two groups, viz. those causing a temperature reaction in the animal and those which do not. Therefore it is always advisable to determine firstly whether or not the sick dog has a high temperature. The temperature of a dog can be determined only be means of a thermometer and in no other way. The old belief that a dog has a high temperature when its nose is dry or that there is no temperature if the nose is moist, is a fallacy. The temperature of a dog is taken by inserting an ordinary thermometer into the anus to the depth of one to two inches. If the thermometer is treated with soap, vaseline or a thin oil, it will slip into the anus more easily. Usually it is left in the anus for one to two minutes and then the reading is made. An ordinary clinical thermometer can be used for dogs but the rectal thermometer, with its short, thick mercury bulb, is more suitable as it does not break so easily.

The normal temperature of full-grown dogs varies from 101 to 102 degrees Fahrenheit; in young pups it can even be 103 degrees. The temperature is affected by various circumstances, e.g. the morning temperature is always lower than the evening temperature; exercise usually causes a rise in temperature, etc., therefore, too much importance should not be attached to an evening temperature of 103 degrees, but the same temperature in the morning may be of significance. The prevailing temperature outside the body should thus always be taken into account and certain slight allowances made for this.

After the dog's temperature has been taken, a general examination should be made. The pulse is felt on the inside of the hindleg by placing the hand over the knee and pressing the fingers down on the inside of the hindleg. The character of the pulse is more important than its speed. Excitement and a high temperature cause an increase in the pulse rate, but the character of the pulse is scarcely affected. Biliary fever and other conditions which cause anaemia, cause an increased pulse beat, but at the same time the pulse develops a characteristic jerky nature which makes the pulse clearer and more easily felt—the pulse is so characteristic that frequently biliary fever can be diagnosed by feeling the pulse only.

Thirdly the mucous membranes of the mouth and eyes must be examined to determine whether these are a clear, healthy pink colour. Changes of colour, which frequently occur, are paleness (e.g. in biliary fever and hookworm infection, as a result of anaemia); a yellow colour as a result of jaun-

Nadat die hond se temperatuur gemeet is, gaan 'n mens met die algemene ondersoek voort. Die pols word aan die binnekant van die agterbeen gevoel deur voor om die knie te vat en die vingers op die binnekant van die agterbeen vas te druk. Die aard van die polsslag is belangriker as die spoed daarvan. Opgewondenheid en hoë koors veroorsaak 'n verhoging van die getal polsslae per minuut maar beïnvloed skaars die karakter daarvan. Galkoors e.a. toestande wat met bloedarmoede gepaard gaan, veroorsaak ook 'n versnelde polsslag maar terselfdertyd kry die polsslag 'n karakteristieke skopgeaardheid wat dit baie duideliker en makliker voelbaar maak—so karakteristiek is die pols dat 'n mens dikwels galkoors kan diagnoseer deur net die pols te voel.

Derdens word die slymvliese van die bek en oë ondersoek om vas te stel of hulle die helder, gesonde pienk kleur het. Kleurveranderinge wat dikwels voorkom is bleekheid (bv. by galkoors en haakwurmbesmetting, as gevolg van bloedarmoede), 'n geel kleur as gevolg van geelsug, vaal of bleekblou as gevolg van te min suurstof in die bloed en donkerrooi of vuilrooi as gevolg van 'n ontsteking van die slymvlies, bv. by hondesiekte. Terselfdertyd kan 'n mens dan bepaal of daar rou seertjies op die slymvlies, bv. van die bek of tandvleis is, of die asem besonder sleg ruik, of daar taai slym uit die bek vloei, of die tandvleis maklik bloei ens.

Verder ondersoek 'n mens die vel, veral op die maag en lies vir die aanwesigheid van puisies, ens., die asemhaling, hoe die hond loop, hoe hy op prikkels reageer, ens.

Die sukses van die vasstelling van 'n siekte hang af van hoe deeglik die hond ondersoek word. Daarom is dit noodsaaklik om alle moontlike simptome wat die dier toon, te probeer opspoor, hulle almal bymekaar te sit en dan eers 'n diagnose te maak. Om net op een simptoom 'n diagnose te maak, is altyd gevaarlik.

Gerieflikheidshalwe word slegs 'n kort opsomming van die algemeenste siektes van honde gegee en word daar baie duidelik gewaarsku dat die leek alleen dit moet doen wat hy werklik kan doen of verplig word om te doen omdat hy nie die hulp van 'n veearts kan kry nie. Dit sal nie alleen die werk vergemaklik en veraangenaam nie, maar selfs onaangename ondervindings uitskakel. Om sukses verder te verseker, is dit noodsaaklik dat 'n persoon wat enige middel gebruik, altyd 'n mate van kennis van die middel sal besit en veral dat hy die middel streng volgens voorskrif volgens die regte dosis en metode sal toedien. In die geval van inspuitings veral is dit noodsaaklik om met sekerheid vas te stel of die middel onder die vel (subkutaan), in die aar (binne-aars) of in die spiere (binne-spiers) toegedien word.

Wanneer 'n inspuiting toegedien word, is dit nodig dat 'n gesteriliseerde spuit en naald gebruik word. Sterilisasie van 'n spuit en naald kan verseker word deur dit vir 5–10 minute te kook. Die plek waar die inspuiting gegee word, moet ook deeglik ontsmet word deur dit met 'n stukkie watte, in jodium-tinktuur, brandspiritus of alkohol geweek, te vryf en selfs die hare vooraf af te skeer indien nodig. Deur vuil, ongesteriliseerde instrumente te gebruik kan 'n mens 'n abses, onnodige afsterwing van weefsel en selfs bloedvergiftiging veroorsaak wat onaangenamer is as die gevolge van die eintlike siekte waarteen 'n mens die dier behandel. Wanneer 'n middel toegedien word of dit deur middel van 'n inspuiting of deur die bek of hoe ookal geskied, is dit altyd noodsaaklik om die dier goed te beheer—die toediening van enige middel is gewoonlik die taak van tenminste twee persone. Dit verseker dat 'n mens nie naalde breek, van die middel mors, ens. nie.

dice; a grey or bluish colour due to lack of oxygen in the blood; and a dark red or dirty red colour caused by infection in the mucous membranes, as for example in distemper. At the same time it can be ascertained whether there are small, open sores on the mucous membrane, e.g. of the mouth or gums; whether the breath smells offensively; whether there is a flow of sticky mucus from the mouth and whether the gums bleed easily.

The skin must then be examined, especially that of the stomach and groin, for the presence of pimples, etc.; also the breathing, the dog's gait and and its reaction to stimuli.

Success in determining the nature of the illness depends on the thoroughness of the examination of the dog. Therefore it is essential to try to trace all possible symptoms shown by the animal, and to take all these into consideration before making a diagnosis. Basing a diagnosis on one symptom only is always dangerous.

For convenience only a short summary is given of the most common diseases of dogs, but the warning is sounded clearly that the layman must only attempt treatment if he is capable or compelled to do so because he cannot obtain the services of a veterinary surgeon. This will not only facilitate the work and render it more agreeable, but it will also exclude unpleasant experiences. To ensure success it is essential that a person applying a remedy should have some knowledge of it and that the remedy should be administered strictly according to prescription, correct dosage and method. In the case of injections it is imperative that it should be ascertained whether the remedy is to be applied subcutaneously, intravenously or intramuscularly.

When an injection is given, a sterilised syringe and needle must be used. Sterilisation of the syringe and needle necessitates boiling of these for five to ten minutes. The site of the injection should be disinfected thoroughly by swabbing with cotton wool, previously soaked in either tincture of iodine, methylated spirit or alcohol and, if necessary, the hair on this area should be shaved off. The use of dirty, unsterilised instruments can lead to the formation of an abscess, unnecessary destruction of tissue and even blood-poisoning, all of which are more unpleasant than the after-effects of the actual illness for which the animal was treated.

When a remedy is administed either by means of an injection or by the mouth or in whatever way, it is always essential that the animal should be well under control—the administration of the remedy is usually the task of two people at least. This prevents the breaking of needles, the spilling of the medicine, etc.

BILIARY FEVER (GALKOORS).

Causal Organism.

Babesia canis, a parasite found in the red blood corpuscles, which are destroyed as it multiplies.

Carriers.

Ticks only.

GALKOORS (BILIARY FEVER).

VEROORSAKENDE ORGANISME.

Babesia canis, 'n parasiet wat in die rooi-bloedselle voorkom en hulle vernietig namate dit vermenigvuldig.

OORDRAERS.

Net bosluise.

SIMPTOME.

Geen of baie swak eetlus.

Lusteloosheid.

Koors gewoonlik hoog, tot 106 grade.

Slymvliese van die oë, mond en tong word bleek en soms selfs geel.

Asemhaling in die latere stadium vinnig en rukkerig.

Pols vinnig en hard.

Urien ligrooi tot donkerrooi; by strawwe gevalle selfs die kleur van swart koffie.

Strawwe dors, veral as die koors hoog is.

Gewoonlik leef die hond vir 5–7 dae, maar chroniese gevalle wat selfs weke aanhou, kom voor.

BEHANDELING.

1. Onderhuidse of binne-aarse inspuiting van 1–2 persent Tripaanblou oplossing—1 c.c. per 7–8 pond gewig. Onderhuidse inspuiting van hierdie middel veroorsaak dikwels 'n abses.

2. Onderhuidse inspuiting van—
   - (*a*) acaprin ·5 persent—1 c.c. per 40 pond gewig—maksimum dosis 1 c.c.;
   - (*b*) pirevan ·5 persent—soos vir acaprin;
   - (*c*) phenamidine, 5 persent—1 c.c. per 8 pond gewig.

Een inspuiting van enigeen van hierdie middels is gewoonlik voldoende, maar dit kan na 24–36 uur herhaal word indien die koors nie definitief af kom nie.

Deeglike verpleging is noodsaaklik.

VOORKOMING.

Hou honde skoon van bosluise. Geen voorbehoedende entstof teen hierdie siekte nie. Honde wat eenkeer galkoors gehad het, kan dit weer kry.

HONDESIEKTE (DISTEMPER).

VEROORSAKENDE ORGANISME.

'n Baie klein kiem, genoem 'n virus. 'n Erg aansteeklike siekte wat deur kontak met siek honde of draers van die kiem of selfs met hul besmette beddegoed, mis en urien, opgedoen word. Oordraging deur die mens met sy hande vind ook maklik plaas. Sommige honde wat die siekte gehad en genees het, bly draers van die virus en kan ander vatbares aansteek. Veral jong honde, selfs 'n paar dae of weke oud, is vatbaar.

SIMPTOME.

Hond lyk asof hy aan verkoue ly.

Oë en neus dra eers net slymerig, later etterig sodat die neus en oë selfs toekoek; dikwels hoes hy.

Koors wissel van 103–106 grade, afhangende van die aanwesigheid van komplikasies.

SYMPTOMS.

Poor or no appetite.

Listlessness.

Temperature usually high, up to 106 degrees.

Mucous membranes of the eyes, mouth and tongue become pale and sometimes even yellowish.

Breathing in the later stages fast and irregular.

Pulse fast and hard.

Urine light red to dark red; in severe cases even the colour of black coffee.

Severe thirst, especially when the fever is high.

Usually the dog lives from five to seven days, but chronic cases, lasting for weeks, occur.

TREATMENT.

1. Subcutaneous or intravenous injection of 1–2 per cent Trypan-blue solution—1 c.c. per 7–8 pounds weight. Subcutaneous injection of this remedy frequently causes an abscess.

2. Subcutaneous injection of—
   - (*a*) Acaprin ·5 per cent—1 c.c. per 40 pounds weight—maximum dose 1 c.c.;
   - (*b*) Pirevan ·5 per cent—as for Acaprin;
   - (*c*) Phenamidine 5 per cent—1 cc.. per 8 pounds weight.

One injection of any of the above is usually sufficient, but this can be repeated after 24–36 hours if the temperature does not drop. Careful nursing is essential.

PREVENTION.

Dogs should be kept free of ticks. No preventative vaccine against this disease. Dogs do not become immune to this disease; repeated attacks may occur, necessitating repeated treatments.

DISTEMPER (HONDESIEKTE).

CAUSAL ORGANISM.

A minute germ, known as a virus. An extremely contagious disease, transmission of which may take place by contact with sick dogs or carriers of the germ or even by means of infected bedding, faeces or urine. Transmission by means of a human being's hands may also easily occur. Some dogs, which have suffered from the disease and recovered, remain carriers of the virus and can infect others, susceptible to it. Young dogs especially, even those a few days or weeks old, are most susceptible.

SYMPTOMS.

Dog appears to be suffering from a cold. Eyes and nose first show a slimy, later a suppurating discharge, so that the nose may be blocked, and the eyelids sealed together. Frequently there is coughing.

Temperature varies from 103 degrees to 106 degrees, this being dependant on the presence of complications.

Poor or no appetite.

Sometimes dogs vomit and suffer from diarrhoea.

Die eetlus kan swak of afwesig wees.
Soms bring honde op en lakseer.
Die slymvliese van die bek en oë is gewoonlik besonder rooi.
Puisies en rooi kolletjies ontwikkel soms op die pens en in die lieste.

KOMPLIKASIES.

Die volgende kom baie maklik voor en is gewoonlik vir die dood verantwoordelik:—

(1) Longontsteking.
(2) Strawwe maagdermontsteking met vermering en laksering.
(3) Senuweeaandoeninge, bv. verlamming van die agterlyf, aanvalle soos vallende siekte wanneer skuim uit die bek vloei en die tande op mekaar geklap word, spierrukkings wat 'n ledemaat aanhoudend laat ruk of die tande op mekaar laat klap, ens.

BEHANDELING.

Behandeling van die gevalle wat senuweesimptome toon is gewoonlik nutteloos.

Deeglike verpleging is noodsaaklik.

Vir die gewone gevalle van Aristamid-, Sulphamezathine- of Sulphatriad-pille ingegee word of inspuitings van dié middels kan toegedien word. Dosis van bogenoemde pille: 1½ pille per 10 pond gewig as eerste dosis en daarna 'n kwart soveel tweekeer per dag. Inspuitings van procaine penisillien of penisillien in olie (300,000 eenhede eenkeer per dag) kan ook in plaas van vermelde middels gebruik word. Gevalle wat straf lakseer en opbring kan Sulphaguanidine (3–4 pille) en kaolien ('n teelepel- tot dessertlepelvol) tweekeer per dag ingegee word.

Penisillien oogsalf of oogsalf wat van die ander antibiotika bevat kan drie- tot vierkeer per dag in die oë gebruik word om die ontsteking teen te werk.

VOORKOMING.

Ent honde tussen 2 en 4 maande oud met die voorbehoedende entstof. Dit verseker onvatbaarheid in 9 uit 10 gevalle vir hul leeftyd.

HONDSDOLHEID.
(Hidrofobie of dolhondsiekte.)

VEROORSAKENDE ORGANISME.

'n Virus wat die senuweegestel aanval. Oordraging geskied wanneer 'n besmette dier (hond, jakkals, kat, meerkat, ens.) 'n ander gesonde dier byt. Mens ook baie vatbaar; daarom moet diere wat vermoedelik aan hondsdolheid ly, uiters versigtig gehanteer en daarna deeglik afgehok word.

SIMPTOME.

Dit kan soms maande duur voordat die simptome ontwikkel, gewoonlik egter 6–8 weke of selfs gouer.

Simptome word in drie stadia verdeel:—

(*a*) Stadium van gedragsverandering: lyk bang, is onrustig, kruip weg, wil nie meer bevele gehoorsaam nie, blaf onnodig, hap na iets denkbeeldigs, ens.

The mucous membranes of the mouth and eyes are generally exceptionally red.

Pustules and red spots sometimes appear over the stomach and in the groins.

COMPLICATIONS.

These occur easily and are generally the cause of death:—

(1) Pneumonia.

(2) Severe enteritis, accompanied by vomiting and diarrhoea.

(3) Nervous disorders, e.g. paralysis of the hind quarters, fits similar to epilepsy, when there is foaming at the mouth and chattering of the teeth, muscular contractions, which cause constant jerking of a limb or chattering of the teeth, etc.

TREATMENT.

Treatment of cases showing nervous symptoms is usually in vain.

Careful nursing is essential.

For the ordinary cases Aristamid, Sulphamezathine or Sulphatriad tablets or injections of these remedies can be administered.

Dosage of these pills: 1½ pill per 10 pounds weight as the first dose and then a quarter of this dose twice daily. Injections of procaine penicillin or penicillin in oil (300,000 units once daily) can be used instead of the above-mentioned remedies.

For cases with severe diarrhoea and vomiting Sulphaguanidine (3–4 pills) and kaolin (a teaspoonful to a dessertspoonful) can be given twice daily.

Penicillin eye-ointment or eye-ointment containing other antibiotics can be applied to the eyes three or four times per day to check the infection.

PREVENTION.

Dogs from two to four months should be inoculated with the preventive vaccine. This ensures immunity for life in nine out of ten cases.

HYDROPHOBIA (HONDSDOLHEID, HIDROFOBIE OR DOLHONDSIEKTE).

CAUSAL ORGANISM.

A virus which attacks the nervous system. Transmission occurs when an infected animal (dog, jackal, cat, mongoose, etc.,) bites a healthy animal. Human beings are also susceptible, therefore animals suspected of suffering from hydrophobia should be handled with utmost care and isolated securely.

SYMPTOMS.

The incubation period may be months, but generally the symptoms appear after six to eight weeks or even sooner.

The symptoms are divided into three phases:—

(*a*) Phase of change in behaviour: appears timid, is restless, hides, will not obey commands, barks unnecessarily, snaps at imaginary objects, etc.

(*b*) Stadium van verhoogde prikkelbaarheid: volg 'n paar dae na die eerste stadium. Byt maklik as 'n mens met hom praat, wil streel, ens. Geringste prikkels bv. lawaai laat hom wegspring en selfs byt. Vreet vreemde voorwerpe bv. klippe, stokke, ens. Die wond waarvandaan hy die siekte opgedoen het, word aanhoudend gelek en selfs stukkend gebyt. Gewoonlik baie dors maar vind dit moeilik om te sluk. Dan word hy dol, dwaal rond, byt alles wat voorkom, kou aan vreemde voorwerpe en kry 'n boosaardige uitdrukking.

(*c*) Stadium van verlamming: moeilikheid om te sluk, kan nie blaf nie, word dooiërig, loop waggelend met oop bek wat erg kwyl, oë en (of) ore trek miskien skeef. Daarna raak hy byna heeltemal verlam en vrek.

Die drie stadia saam duur gemiddeld 6–7 dae.

BEHANDELING.

Moet dit nie probeer nie.

Indien Hondsdolheid vermoed word, plaas hond in 'n stewige hok en rapporteer dit dadelik aan die naaste Polisiestasie of veeartskantoor.

Honde kan vooraf teen hondsdolheid geënt word of selfs direk nadat hulle deur 'n ander besmette dier gebyt is, maar nie wanneer 'n lang tyd verloop het of wanneer hulle reeds die simptome begin toon nie.

RICKETTSIA-SIEKTE VAN HONDE.

VEROORSAKENDE ORGANISME.

Rickettsia canis, 'n bloedkiem, wat naverwant aan die virusse is. Word eintlik net in die warmer streke van die Transvaal aangetref.

OORDRAERS.

Bosluise.

SIMPTOME.

Lusteloosheid.
Swak eetlus.
Oë sak weg.
Slymvliese erg rooi, soms selfs perserig.
Soms vermering en stank van die asem.
Soms ontwikkel 'n ronde sweer waar die bosluis gebyt het.
Soms ontwikkel daar puisies op die vel.
Snelle vermaering.
Meeste honde vrek na twee weke of meer.
Die siekte moet veral onderskei word van galkoors.

BEHANDELING.

Deeglike verpleging.

Inspuitings van:—

(*a*) Sulphamezathine-natrium.
(*b*) Aristamid-natrium.
(*c*) Aureomisien.

VOORKOMING.

Hou honde skoon van bosluise.

(*b*) Phase of increased irritability: this occurs a few days after the first phase. Bites easily when being spoken to or being petted, etc. Slightest stimuli, e.g. noises, cause excitement and even biting. Eats and gnaws foreign substances such as stones, sticks, etc. Constantly licks and even bites the wound from where it was infected. Usually very thirsty but finds it difficult to swallow.

Then it becomes rabid, wanders about, biting whatever comes in its way, chews foreign objects and has a frenzied appearance.

(*c*) Phase of paralysis: difficulty in swallowing, cannot bark, becomes listless, staggering walk with open, slobbering mouth, eyes and (or) ears are awry. After this it becomes almost totally paralysed and dies.

On an average the three phases last from six to seven days.

TREATMENT.

Should not be attempted.

If Hydrophobia is suspected, the dog should be placed in a sturdy pen and the case reported immediately to the nearest police station or veterinary office.

PREVENTION.

Dogs can be inoculated beforehand against hydrophobia and even directly after they have been bitten by an infected animal, but inoculation is of no avail when some time has elapsed or the symptoms have commenced.

RICKETTSIOSIS OF DOGS.

CAUSAL ORGANISM.

Rickettsia canis, a germ in the blood, closely related to the viruses. Usually only found in the warmer regions of the Transvaal.

CARRIERS.

Ticks.

SYMPTOMS.

Listlessness.
Poor appetite.
Eyes sunken.
Mucous membranes exceptionally red, sometimes even purplish.
Possibly vomition; offensive breath.
Sometimes a wound develops where the infected tick was attached.
Pustules may develop on the skin.
Rapid loss in weight.
Most dogs die after two weeks or longer.
Differentiation between this disease and biliary fever is necessary.

TREATMENT.

Careful nursing.

Injections of—

(*a*) Sulphamezathine-Sodium;
(*b*) Aristamid-Sodium;
(*c*) Aureomycin.

PREVENTION.

Dogs should be kept free of ticks.

VERMERING.

'n Hond kan byna na willekeur braak, maar gewoonlik is dit die gevolg van 'n siektetoestand, en wanneer dit herhaaldelik voorkom moet 'n mens dus altyd die oorsaak probeer vasstel en daarna behandeling toepas.

Die mees gewone oorsake van vermering is:—

(*a*) Ontsteking van die maag-slymvlies (ook genoem maagkatar).
(*b*) Vergiftiging met bytende middels, bv. arseen, bytsoda, ens.
(*c*) Verstopping van die dunderm bv. 'n perskepit, wurms, ens. wat die deurvloei van voedsel verhoed.
(*d*) Gewone verstopping (van die ners- of agterderm) wat al 'n paar dae bestaan.
(*e*) Chroniese nierontsteking.
(*f*) Verskeie ander oorsake soos lewersiektes, buikvliesontsteking, baarmoederontsteking by tewe, ens. wat die leek egter nie kan diagnoseer en behandel nie.

(*a*) Katar of ligte ontsteking van die maag-slymvlies: Tipies by hierdie siekte is dat die hond nie juis erg siek is nie, maar geneig is om te braak, veral kort *nadat* hy gevreet het.

(*b*) Sien Vergiftigings.

(*c*) Verstopping van die dunderm deur 'n perskepit, klip, stuk been of by jong hondjies selfs deur massas rondewurms, lei tot vermering. Die hond bring dan enige tyd en herhaaldelik op, ook tussen die maaltye—soms net 'n klein bietjie waterige vloeistof. Die koors is eers net effens verhoog (103 grade F), maar gou ontstaan daar 'n ontsteking van die buikvlies om die derm wat die koors hoog laat styg en maklik die dood veroorsaak.

(*d*) Gewone verstopping—sien Hardlywigheid en verstopping.

(*e*) Chroniese nierontsteking—sien Chroniese Nierontsteking.

BEHANDELING.

Van die talle oorsake is dit duidelik dat een behandeling vir alle gevalle van vermering nie voorgeskryf kan word nie. Die eintlike oorsaak moet behandel word, daarom is die diagnose van die oorsaak so belangrik. Nogtans kan die volgende algemene behandeling aanbeveel word:—

(1) Laat slegs klein hoeveelhede, maklik-verteerbare voedsel en water (verkieslik gekookte water) toe. Moenie toelaat dat die hond hom op 'n slag dik vreet of suip nie. Soms is dit selfs wenslik om vir 12–18 uur geen voedsel of water te gee nie. Oorlaaiing van die maag bevorder vermering.

(2) Dien middels toe wat die slymvlies van die maag beskerm, ontsmet en die prikkelbaarheid en ontsteking daarvan teewerk, bv. sulphaguanidine, chlorodyne, bismutsoute, ens. Die beste is om die klaaraangemaakte mengsels van hierdie middels soos Kaopectin, Pektokal, ens. te gebruik. Die dosis hiervan vir 'n jakkalshond is dieselfde as vir 'n volwasse persoon. Waar die vermering met laksering gepaard gaan, kan kaolien ('n teelepel- tot 'n dessertlepelvol twee- tot driekeer per dag) ook saam met hierdie middels toegedien word.

VOMITING.

A dog can vomit almost at will, but usually it is the result of illness and when it occurs repeatedly, the cause should be ascertained and treatment instituted accordingly.

The most common causes of vomiting are:—

(*a*) Inflamation of the mucous membrane of the stomach (also known as catarrh of the stomach).

(*b*) Poisoning by caustic agents, e.g. arsenic, caustic soda, etc.

(*c*) Blockage of the duodenum, e.g. by a peach stone, worms, bone, etc., which prevent the passage of food.

(*d*) Ordinary constipation (of the rectum) of a few days' standing.

(*e*) Chronic nephritis.

(*f*) Various other causes such as diseases of the liver, peritonitis, inflammation of the uterus in bitches which, however, the layman cannot diagnose or treat.

(*a*) Catarrh or slight inflammation of the mucous membrane of the stomach: typical of this disorder is that the dog is not really very ill, but that it vomits, especially just after it has fed.

(*b*) See poisons.

(*c*) Blockage of the duodenum by a peach stone, a stone, a piece of bone and in young pups even masses of round worms, causes vomiting. In this case the dog vomits a small amount of watery fluid at any time and repeatedly, also in between meals. At first the temperature rises only slightly—103 degrees F.—but soon there is inflammation of the peritoneum which brings about a sharp rise in temperature and can easily cause death.

(*d*) Ordinary constipation—see constipation and stoppage.

(*e*) Chronic nephritis—see Chronic Nephritis.

TREATMENT.

Considering the numerous causes it is apparent that one treatment will not serve for all cases of vomiting. The actual cause must be treated and for this reason the diagnosis of the cause is very important. Nevertheless the following general treatment can be recommended:—

(1) Allow the dog only small quantities of easily digestable food and water (preferably boiled water). Do not allow the dog to overeat or drink too much water. Sometimes it is advisable not to give food or water for 12 to 18 hours. Overloading of the stomach promotes vomiting.

(2) Administer remedies which will protect and disinfect the mucous membrane of the stomach and arrest the irritation and inflammation, e.g. Sulphaguanidine, Chlorodyne, bismuth salts, etc. It is best to use the proprietary mixtures of these remedies such as Kaopectin, Pektokal, etc. The dose of these for a foxhound is the same as for an adult person. Where vomiting is accompanied by loose action of the bowels, kaolin (a teaspoon- to a desertspoonful, two or three times a day) should be given in conjunction with these remedies.

HARDLYWIGHEID EN VERSTOPPING.

Daarmee word bedoel die aansameling en uitdroging van ontlasting in die agter- of nersderm.

OORSAKE.

Gebrek aan oefening.

Verkeerde dieet.

Te veel bene in die voedsel wat miskien fyngekou word maar tog in die nersderm vaspak. 'n Groot stuk been kan ook in die nersderm vassit.

Te min geleentheid om te ontlas bv. wanneer honde lank op hok gehou word of wanneer hulle oor lang afstande vervoer word.

Volop skoon drinkwater help om die ontlasting sag te hou.

SIMPTOME.

Eers probeer die hond net af en toe ontlas sonder enige resultaat; geen verdere simptome nie. Later word hy lusteloos, wil nie bra vreet nie, ontwikkel 'n geringe koors (103 grade) en 'n slegte reuk van die asem en daarna eers tree herhaaldelike vermering te voorskyn.

BEHANDELING.

Vir hardlywigheid is aptekersparaffien (liquid paraffin) seker die aangewese middel—twee tot drie eetlepelsvol vir 'n jakkalshond, daarna 'n dessertlepelvol een- of tweekeer per dag. Sien toe dat die dieet korrek is—veral growwe koringsemels kan by die voedsel gegooi word.

Verstopping moet deur 'n lavement (enema) behandel word. Soms is dit selfs nodig om die droë harde ontlasting met die vinger of 'n instrument versigtig stukkend te breek. Tyd en baie geduld is nodig. Deur roulynolie of aptekersparaffien in die nersderm in te spuit word die proses aansienlik vergemaklik. Soms is dit nodig om die ontlasting bietjies-bietjies met tussenposes van 'n uur of meer te verwyder.

LAKSERING

Laksering volg gewoonlik op 'n ontsteking van die dermkanaal. Ontsteking van die derm kan baie oorsake hê, bv.—

(*a*) vergiftiging met gifstowwe soos arseen, ens.;
(*b*) kiembesmettings wat veral die dermslymvlies aantas. Dit kan primêr wees soos bv. by koksidiose, of sekondêr bv. by hondesiekte, chroniese nierontsteking, ens.;
(*c*) wurmbesmetting, veral by jong hondjies.

BEHANDELING.

Dit hang eintlik af van die oorsaak. In die algemeen kan die volgende aanbeveel word:—

(*a*) Reguleer die voedsel—gee slegs klein hoeveelhede maklik-verteerbare voedsel en water met tussenposes van 'n paar uur. Gekookte water is die beste.

(*b*) Dien dermontsmettende middels en middels om laksering teen te werk, toe, bv. sulphaguanidine of aristamidpille, kaolien, bismutsoute, opium- of morfienpreparate, ens. Klaar-aangemaakte mengsels van hierdie middels, bv. Kaopectin, Pektokal, ens. (vir 'n jakkalshond dieselfde dosis as vir 'n volwasse persoon), waarby nog 'n teelepelvol kaolien gemeng word, kan driekeer per dag toegedien word.

CONSTIPATION AND STOPPAGE.

By this is meant the accumulation and drying out of the faeces in the rectum.

CAUSES.

Lack of exercise.

Wrong diet.

Too many bones in the food, which, although they may have been well chewed, may accumulate in the rectum. A large piece of bone can also become lodged in the rectum. Too little opportunity to defaecate, for instance when dogs are kept in kennels for a long time or transported over long distances.

Sufficient clean drinking water helps to keep the faeces soft.

SYMPTOMS.

At first the dog tries to defaecate every now and then without any result; no other symptoms. Later the dog becomes listless, will not eat, develops a slight temperature (103 degrees) and an offensive breath and only after this do repeated attacks of vomiting occur.

TREATMENT.

Liquid paraffin is the ideal remedy for constipation and foxhounds should be dosed as follows: two to three tablespoonsfull and after that a dessertspoonfull once or twice daily. See that a correct diet is given—bran can be added to the food.

Stoppage should be relieved by an enema. Sometimes it may even be necessary to break up the hard, dry faeces with a finger or an instrument. Time and a good deal of patience is required. The process is considerably facilitated by injecting raw linseed oil or liquid paraffin into the rectum. It may be necessary to remove the faeces little by little at intervals of an hour or more.

DIARRHOEA.

(Looseness of the Bowels.)

Looseness of the bowels is generally due to an inflammation of the alimentary canal. Inflammation of the intestine may have numerous causes such as:—

- (*a*) Poisoning by irritants, e.g. arsenic, etc.
- (*b*) Germ infection, which particularly affects the mucous membrane of the alimentary canal. This can be primary as in coccidiosis, or secondary as in distemper, chronic nephritis, etc.
- (*c*) Worm infection, especially in young pups.

TREATMENT.

This depends on the cause. In general, the following can be recommended:—

- (*a*) Regulate the diet—give only small quantities of easily digestable food and water at intervals of a few hours. Boiled water is preferable.
- (*b*) Administer bowel disinfectants and remedies to arrest the looseness of the bowels, e.g. Sulphaguanidine or Aristamid pills, Kaolin, bismuth salts, opium or morphine preparations, etc. Proprietary mixtures of these remedies, e.g. Kaopectin, Pektokal, etc. (of which the dose for a foxhound is the same as that for an adult person) to which a teaspoonful of Kaolin has been added, can be given three times per day.

HOES, BRONCHITIS EN LONGONTSTEKING.

Hoes is 'n simptoom wat dikwels by honde voorkom. Dit ontstaan as gevolg van 'n irritasie van enige gedeelte van die asemhalingsorgane—die lugpyp, die fyner longpypies en selfs die longweefsel. Maar dit kan ook volg op 'n irritasie van die keel, bv. by mangel-ontsteking, ontsteking van die strottehoof, ens. Die irriteerbaarheid is gewoonlik die gevolg van 'n ontsteking (inflammasie). So kry 'n mens dan dikwels 'n hoes by keelontsteking en gewoonlik by lugpypontsteking (tracheitis), ontsteking van die longpypies (bronchitis) en longontsteking (waar die fynste longpypies ook altyd aangetas is). Verder kom 'n hoes ook gewoonlik voor by 'n ontsteking van die borsvlies (pleuritis) selfs al is die longe nie aangetas nie.

Hierdie ontstekings kan primêr wees, m.a.w. sonder dat daar enige ander gedeeltes van die liggaam aangetas is of sonder dat daar 'n ander siekte bestaan, of, hulle kan sekondêr wees, m.a.w. hulle volg op ander siektes wat die asemhalingsorgane of die algemene weerstand van die dier verswak sodat 'n besmetting met soms skadelose kieme tog kan ontstaan. Laasgenoemde vind 'n mens veral by hondesiekte.

Die aard van die hoes kan baie verskil, bv. by 'n ontsteking van die keel en lugpyp is die hoes kragtig en volg daar dikwels 'n braakbeweging wat net 'n bietjie slym tevoorskyn laat kom. By bronchitis is die hoes gewoonlik ook sterk, terwyl by longontsteking dit dikwels net 'n kort, swak hoesie is wat herhaaldelik voorkom. By borsvliesonsteking gaan die hoes gewoonlik gepaard met 'n duidelike uitdrukking van pyn.

Die ernstigheid van die oorsaak van die hoes kan gewoonlik bepaal word deur die algemene gesondheidstoestand van die hond in aanmerking te neem. 'n Hond wat hoes as gevolg van 'n ligte ontsteking van die lugpyp is gewoonlik nog fris en gesond terwyl een wat ly aan bronchitis of longontsteking gewoonlik regtig siek is, 'n koors het, lusteloos is, nie juis wil vreet nie en duidelik toon dat daar met die asemhaling iets verkeerd is. Hoe strawwer siek die hond is, hoe meer dra sy neus en oë.

BEHANDELING.

Die behandeling hang af van die oorsaak. By die ligte, eenvoudige gevalle van lugpyp- of longpypontsteking sal 'n paar dae verpleging plus die toediening van die gewone hoesmiddels vir die mens, herstel te weeg bring. Die dosisse van hierdie middels vir 'n jakkalshond is dieselfde as vir 'n volwasse mens. By die ernstiger gevalle soos longontsteking, borsvliesontsteking en keelontsteking moet van die sulfa-middels soos aristamid, sulphamezathine en sulphatriad of penisillien gebruik word. Die dosisse is soos volg:—

Sulfas.—1½ tablet per 10–15 pond gewig as eerste dosis en dan die helfte soveel tweekeer per dag, deur die bek.

Procaine Penisillien of Penisillien in Olie.—300,000 tot 400,000 eenhede in die spiere ingespuit eenkeer per dag.

In die reël is dit selde nodig om hierdie behandeling vir langer as 6 dae toe te pas.

BLOEDSAK OF HEMATOOM VAN DIE OOR.

Hierdie toestand volg wanneer daar 'n klein aartjie in die weefsel (tussen die vel en kraakbeen) van die oor bars. Dit ontstaan gewoonlik wanneer 'n hond om die een of ander rede die kop, en dus ook die ore, herhaaldelik en hard skud. Die oor swel en word pynlik. Later kan dit so groot soos 'n hoendereier wees. Dis gewoonlik erg pynlik en die kop word skeef gehou.

COUGHING, BRONCHITIS AND PNEUMONIA.

Coughing is a common symptom in dogs. It is caused by an irritation of any part of the respiratory organs—the trachea, the bronchii and even the lung tissue. But it can also be due to an irritation in the throat, e.g. tonsillitis, laryngitis, etc. Usually the irritation is the result of inflammation. Thus coughing frequently accompanies laryngitis and usually tracheitis, bronchitis and pneumonia (when the most delicate bronchioli are always affected). A cough is also usually present in pleurisy, even though the lungs are not affected.

These infections may either be primary, i.e. no other parts of the body may be affected or there may be no other disease, or they may be secondary, i.e. they may be the complications of other diseases which have weakened the respiratory organs or general resistance of the animal so that infection by even harmless germs may develop. The latter is common in distemper.

The nature of the cough may vary, e.g. in laryngitis the cough is powerful and usually followed by a vomiting movement, although only a little slime is brought up. The cough accompanying bronchitis is usually strong, while in pneumonia there is frequently only a short, weak cough which occurs repeatedly. In pleurisy the cough is accompanied by signs of pain.

The seriousness of the cause of the cough can usually be determined by taking the general condition of the dog into account. A dog coughing as a result of slight inflammation in the trachea is still well, but one suffering from bronchitis or pneumonia is generally really ill, runs a temperature, is listless, disinclined to eat and clearly shows that something is wrong with the breathing. The severer the attack, the greater the discharge from the eyes and the nose.

TREATMENT.

The treatment depends on the cause of the cough. For mild, straightforward cases of inflammation in the trachea or bronchi, a few days nursing plus the administration of the common cough remedies for humans, should effect a cure. Foxhounds receive the same dose of these remedies as adult persons. For more serious cases such as pneumonia, pleurisy and laryngitis, sulpha drugs, e.g. Aristamid, Sulphamezathine or Sulphatriad, or penicillin should be used. The doses are:—

> *Sulphas.*—1½ tablets per 10–15 pounds weight as the first dose and then half as much twice daily, to be given by mouth.
>
> *Procaine penicillin or penicillin in oil.*—300,000 to 400,000 units to be injected intramuscularly once daily.

Generally it is seldom necessary to continue this treatment for longer than six days.

HAEMATOMA OF THE EAR.

This condition arises as a result of the rupture of a small bloodvessel in the ear tissue (between the skin and cartilage). This is generally caused when the dog, for some or other reason, shakes its head violently and repeatedly. The ear becomes swollen and is painful. It may later develop to the size of a fowl's egg. This is generally very painful and the head is held to one side.

BEHANDELING.

As geen behandeling toegepas word nie, begin die swelsel na ongeveer 10 dae stadigaan krimp en die oor bly later verkrimp en styf. Om die misvorming te verhoed, moet die oor sodra die siekte begin, aan die binnekant oor die swelsel oopgesny en die bloed uitgedruk word. 'n Aantal steke word dan dwarsdeur die oor gesit sodat hulle die vel teen die kraakbeen vasdruk en die snit oor die swelsel weer toemaak. Daarna word die oor dan teen die kop verbind sodat dit nie weer geskud kan word nie.

„ OORKANKER."

Hierdie skrikwekkende naam word gebruik vir ekseem van die binnekant van die oor. Twee soorte ekseem van die oor kom voor, nl. 'n droë, skubberige en 'n nat, veretterende vorm. By laasgenoemde vorm ruik die oor sleg en koek die hare aan die rante van die oor dikwels. Die hond probeer die oor dikwels krap, skud die kop en hou dit dikwels skeef. Die vel aan die binnekant is rooi of selfs rou en met etter bedek.

BEHANDELING.

Die droë skubberige vorm kan behandel word deur die aangetaste gedeeltes tweekeer per dag met karbololie, sinksalf of gelyke dele sinksalf en kasterolie te smeer. By die nat, veretterende tipe, wat baie lank kan neem om te genees, moet 'n vogabsorberende middel in poeiervorm tweekeer per dag in die oor gebruik word, bv. Flavoline Wondpoeier, 'n mengsel van gelyke dele stysel en kaolien met 5–10 persent Sulfanilamied daarin, ens.

GRASSADE E.A. VREEMDE VOORWERPE IN DIE OORKANAAL.

Wanneer honde in die veld beweeg, gebeur dit baie maklik dat 'n grassaad in die oorkanaal beland—veral teen die einde van die somer wanneer die grasse ryp word. So 'n hond begin skielik die kop skeef hou en tjank selfs dikwels, veral wanneer die oor ondersoek word, omdat die grassaad die oorkanaal beseer. Die oor moet oopgerek en die vreemde voorwerp met 'n pinset verwyder word. Soms is dit 'n uiters moeilike taak en moet 'n verdowingsmiddel selfs toegedien word om die dier te beheer.

OOGVLIESONTSTEKINGS.

Oogvliesontsteking (conjunctivitis) kom dikwels voor wanneer stof in die oë waai, grasdeeltjies onder die ooglede beland, ens. Verder ontstaan dit dikwels as sekondêre simptoom by ander siektes, bv. hondesiekte, keelontsteking, ens.

Die oë word soms toegeknyp om direkte sonlig uit te hou, water aan die begin en dra later etterig. Die slymvlies van die oog word besonder rooi. Soms versprei die ontsteking na die horingvlies (kyker) van die oog en dit word vaal en kry selfs 'n holtetjie (sweertjie) op met rooi aartjies wat van die wit vlies oor die horingvlies loop.

BEHANDELING.

Oogdruppels van argyrol of sinksulfaat, adrenalien en chloretone of eucaine, wat enige apteker kan toeberei, is doeltreffend teen die gewone, ligte vorms van oogontsteking. Strawwer gevalle moet sonder aarseling met druppels of salwe wat penisillien, aureomisien en/of chloramphenicol bevat, behandel word.

TREATMENT.

If no treatment is given, the swelling begins to shrink slowly after about ten days and the ear later becomes shrivelled and stiff. To prevent this malformation, the ear should be incised on the inside, over the swelling, as soon as it appears and the blood drained. A number of stitches are then inserted through the ear so that the skin is pressed against the cartilage and the incision over the swelling is closed. Then the ear is bandaged against the head so that it cannot be shaken.

EAR CANKER.

This alarming name is used to describe exzema of the inside of the ear. There are two kinds of eczema of the ear, viz. a dry, scaly eczema and a wet, suppurating kind. In the latter type the ear secretes an offensive smelling liquid and the hair along the edges of the ears becomes matted. The dog tries to scratch the ear frequently, shakes its head and holds it to one side. The skin on the inside of the ear is red or raw and covered with wet secretion.

TREATMENT.

The dry scaly kind can be treated by applying carbolic oil, zinc ointment or equal parts of zinc ointment and castor oil to the affected parts twice daily. For the wet, suppurating type, which may take a long time to heal, an absorbent powder should be used in the ear twice a day, e.g. Flavoline wound powder, a mixture of equal parts of starch and Kaolin with 5 to 10 per cent Sulphanilamide added, etc.

GRASS SEEDS AND OTHER FOREIGN BODIES IN THE AUDITORY CANAL.

When dogs exercise in the veld, particularly towards the end of summer when the grasses have ripened, a grass seed can easily enter and become lodged in the auditory canal. The dog suddenly puts its head to one side and whines frequently, especially when the ear is being examined, for the grass seed injures the canal. The ear should be stretched wide open and the foreign body removed by means of forceps. Sometimes this proves to be such a difficult task that an anaesthetic has to be given in order to control the animal.

CONJUNCTIVITIS.

(Inflammation of the mucous membrane of the eyelids and of the white of the eye.)

Conjunctivitis is common when dust enters the eyes, particles of grass become lodged under the eyelids, etc. It is also frequently a secondary symptom of other diseases, e.g. distemper, laryngitis, etc.

The eyes are sometimes kept closed against direct sunlight, water a lot in the beginning and later show a purulent discharge. The mucous membrane of the eye is exceptionally red. Sometimes the infection spreads to the cornea of the eye and it becomes cloudy and may even develop an ulcer with tiny red veins which extend from the white of the eye to the cornea.

TREATMENT.

Eyedrops containing argyrol or zinc sulphate, adrenaline and chloretone or eucaine, which can be prepared by any chemist, are effective for the ordinary, mild cases of conjunctivitis. More serious cases should be treated conscientiously with drops or ointments containing penicillin, aureomycin and (or) chloramphenical.

EKSEEM.

Ekseem bedoel 'n ontsteking van die oppervlakkige lae van die vel. Skynbaar speel baie oorsake 'n rol, bv. voeding, te veel bad in ontsmettingsmiddels, vuilheid van die vel, parasiete, warm weer, ens.

Twee vorme van die siekte is bekend, nl. akuut en chronies.

Akute ekseem.—Dit begin gewoonlik skielik. 'n Klein rooi en later rou kol ontstaan wat dan gekrap word en binne 'n dag of twee is daar 'n groot rou, smetterige kol wat erg pynlik is. Die hare koek op die letsel en verettering tree gou in. Dikwels hang daar onderkant die letsel 'n sakagtige swelsel. 'n Bruin harde kol (vel wat afsterf) kan selfs in die letsel ontstaan.

Chroniese ekseem.—Dit begin gewoonlik op die kruis of op die stertwortel, en kom veral by volwasse of bejaarde honde voor. Die hare word droog en begin uitval en die vel raak verdik en later plooierig. Die letsel jeuk sodat die hond onder voorwerpe inkruip om sy rug te krap.

BEHANDELING.

Akute ekseem genees gewoonlik redelik maklik wanneer van die volgende middels twee- tot driekeer per dag op die letsel gedrup, gestrooi of gesmeer word—Calamine „ Lotion ", Flavoline Wonderpoeier, 'n mengsel van gelyke dele kaolien en stysel met 5–10 persent sulfanilamied daarin. 'n Mens moet die letsel op die een of ander manier probeer beskerm dat die hond dit nie so erg kan krap nie.

Chroniese ekseem is 'n uiters moeilike siekte om te genees en sal selfs na 'n skynbare herstel maklik weer opvlam. Meer prikkelende middels soos Sinksalf met 10 persent Ichthyol daarin, Resinol-salf, ens. kan een- tot tweekeer per dag deeglik op die letsel ingevryf word. Verder is dit nodig dat die dieet deeglik gebalanseer word—veral styselkosse moet verminder word.

GALBULTE.

(Netelroos of *Urticaria.*)

Hierdie siekte ontstaan *skielik* en volg gewoonlik op 'n maagdermverstoring as gevolg van die vreet van verrotte voedsel, ens.

Die hond kry oral op die vel knoppe vanaf so groot soos 'n trippens. Dit jeuk sodat hy probeer skuur. Die ore swel effens en is warm. Die ooglede is soms erg en blink geswel.

BEHANDELING.

Dis nooit 'n dodelike siekte nie maar kan tog lastig wees. By baie gevalle verdwyn die simptome na 'n paar uur vanself. Al wat eintlik nodig is, is dat 'n lakseermiddel, veral Engelse Sout, toegedien word. By baie strawwe gevalle kan 'n antihistamienpreparaat deur inspuiting of in die vorm van pille toegedien word. Enige apteker kan die middels verskaf. Die dosisse vir 'n volwasse jakkalshond is dieselfde as vir 'n volwasse mens.

OMLOOP.

Dis 'n aansteeklike swamsiekte wat ook na die mens oordraagbaar is. Die besmetting vorm min of meer ronde kolle so groot soos 'n sikspens of groter, veral op die kop, maar kan oor die hele lyf voorkom. Op die kolle val die hare uit of breek naby die vel af sodat klein stoppels op die letsel voorkom. Die letsel het gewoonlik 'n melerige of skubberige voorkoms.

ECZEMA.

Eczema is an inflammation of the superficial layers of the skin. Apparently many causes play a role in the causation of this disease, e.g. faulty diet, too frequent bathing in disinfectants, dirt, parasites, warm weather etc.

Two types of this disease are known, viz. acute and chronic:—

Acute eczema.—This usually begins suddenly. A small red spot appears which later becomes raw; this is scratched and within a day or two a large raw, purulent area is caused which is very painful. The hair becomes matted in this region and suppuration sets in speedily. Frequently there is a baggy swelling at the base of the festering area. A hard, brown spot (dead skin) may even be formed in the centre of the affected area.

Chronic Eczema.—This usually begins in the lumbar region or root of the tail and is especially common among full-grown or aged dogs. The hair becomes dry, falls out and the skin becomes thickened and later wrinkled. The affected area itches, causing the dog to rub against objects in order to alleviate the irritation.

TREATMENT.

Acute eczema generally heals fairly easily if one of the following remedies is dripped, strewn or smeared onto the affected part: Calamine lotion, Flavoline wound powder, a mixture of equal parts of Kaolin and starch plus 5 to 10 per cent Sulphanilamide. The affected area must be protected in some manner to prevent the dog from scratching it excessively.

Chronic eczema is an extremely difficult disease to cure and may easily flare up again, even after an apparent recovery. More stimulating remedies such as Zinc Ointment containing 10 per cent Ichthyol, Resinol ointment, etc. should be rubbed into the affected area once or twice per day. Further it is essential that the diet should be well balanced—starchy foods especially, should be decreased.

URTICARIA OR NETTLE-RASH (GALBULTE).

This condition arises *suddenly* and usually follows on a digestive disturbance, e.g. after consuming putrid food, etc.

The dog develops lumps, from the size of a threeepence, everywhere on the skin. These itch so that the dog tries rubbing itself. The ears swell slightly and are warm. Sometimes the eyelids are badly swollen. The whole face may become swollen.

TREATMENT.

This is not a fatal disease but yet it can be very troublesome. In most cases the symptoms disappear of their own accord after a few hours. All that is really necessary is that a laxative, particularly Epsom Salts, should be given. In very severe cases an antihistamine preparation can be administered either by means of an injection or in the form of pills.

Any chemist will be able to supply these. The dose for full-grown foxhounds is the same as for adult human beings.

RINGWORM.

This is a contagious fungal disease to which human beings are also susceptible. The infection gives rise to more or less circular lesions the size of a sixpence or bigger, principally on the head but these can appear over the whole body. The hair falls out over these patches or breaks off close to the skin, so that there are short stubbles in the lesion. The lesion usually has a scaly appearance.

BEHANDELING.

Vryf die letsels een of tweekeer per dag goed in met Agricura Omloopsalf of verf hulle met jodiumtinktuur. Konsentreer veral op die rante van die letsels omdat die besmetting daar die aktiefste is. Na 'n paar dae word die letsel glad wanneer die besmetting dan ook gewoonlik dood is.

WURMPARASIETE VAN HONDE.

1. LINTWURMS.

Verskillende soorte lintwurms kom by honde voor waarvan party vir die mens en huisdiere gevaarlik is, afgesien van hul nadeligheid vir die hond self.

(*a*) *Die komkommerpitlintwurm.*—Die komkommerpitlintwurm (*Dipylidium caninum*).—Hierdie parasiet leef in die dunderm van die hond en die kat en kom soms toevallig ook by kinders voor. Dis die mees algemene lintwurm by honde oral in die wêreld en die rede daarvoor is dat die hondevlooi as sy tussengasheer optree. Die wurm word tot 20 duim lank en die litte waaruit sy liggaam bestaan, is langerig-ovaal, soos komkommerpitte, waardeur die parasiet sy naam gekry het.

Die volwasse of „ ryp " litte wat van die wurm afbreek, word nie net met die dier se mis uitgeskei nie, maar hulle kruip rond soos ruspers en kan te enige tyd self uit die derm uitkruip. Dit is 'n algemene verskynsel by hondelintwurms. Die lit stoot die eiers wat hy bevat uit en versprei hulle deur sy bewegings.

As die eiers van hierdie lintwurm gevreet word deur die larwe van 'n vlooi, ontwikkel daar in die jong vlooi 'n klein blaaswurm. As 'n hond of kat, of toevallig 'n kind, so 'n vlooi later inkry, sal die blaaswurm in 'n lintwurm verander.

(*b*) *Die Draaisiektelintwurm.*—Die Draaisiektelintwurm (*Taenia multiceps*).—Dit is 'n parasiet van honde en jakkalse. Hy word omtrent 1 tot 2 voet lank en die agterste litte is min of meer reghoekig, 'n halfduim lank en een-agste duim breed.

Die belangrikheid van die wurm lê daarin dat sy tussenstadium of blaaswurm in die harsings van skape en beeste ontwikkel, en deur druk op die harsings te veroorsaak, die tekens van draaisiekte verwek. In enkele gevalle is die blaaswurm ook by perde en die mens gevind.

Die ryp litte van die lintwurm word deur die hond of jakkals in die veld uitgewerp en die eiers raak versprei in die gras. As 'n skaap of bees van die eiers inkry, broei hulle in die dunderm uit en die klein wurmpies boor in die dermwand in. Die bloedstroom neem hulle na alle dele van die liggaam, maar hulle ontwikkel net in die brein. Die blaaswurm kan so groot as 'n hoendereier word, het 'n dun wand en bevat 'n helder vloeistof. Aan die binnekant van die wand ontwikkel daar 'n aantal lintwurmkoppe wat so groot as mannasaad is.

(*c*) *Die Langneklintwurm.*—Die Langneklintwurm (*Taenia hydatigena*).—Dit is 'n groot lintwurm wat tot 15 voet lank kan word en leef in die dunderm van honde en jakkalse.

Sy blaaswurm kom voor in die buikholte, tussen die ingewande van skape, bokke, beeste, varke en wildsbokke. Die blaas is gewoonlik so groot as 'n hoendereier, bevat 'n helder vloeistof en één lintwurmkop. Hierdie blaaswurm is algemeen taamlik goed bekend. As 'n hond so 'n blaaswurm vreet, kry hy daarvan 'n lintwurm.

TREATMENT.

Rub Agricura Ringworm ointment thoroughly into the patches once or twice daily or else paint these with tincture of iodine. Concentrate on the edges of the lesions as the infection there is the most active. After a few days the spots become smooth and by then the infection has been destroyed.

WORM PARASITES IN DOGS.

1. TAPE WORMS.

Various tape worms, some of which are dangerous to human beings and domestic animals, apart from their being injurious to the dog itself, occur in dogs.

(*a*) *Dipylidium caninum* (*Komkommerpitlintwurm*).—This parasite is found in the duodenum of the dog and the cat and sometimes appears accidentally in children as well. This is the most common tape worm in dogs throughout the world; the reason being that the dog flea is the intermediate host. The worm may reach 20 inches in length and the segments of the body are fairly long and oval-shaped, like cucumber pips, hence the Afrikaans name, Komkommerpitlintwurm.

The fully-developed or ripe segments, which break away from the worm, are not only evacuated with the animal's faeces, but, as they can move about like caterpillars, they can crawl out of the anus on their own at any time. This is a common occurrence in tape worms in dogs. The segment pushes out the eggs which it holds and distributes them by its movements.

If the eggs of the tapeworm are eaten by the larva of a flea, a small cyst will develop in the young flea. If a cat or a dog or by some chance, a child, should swallow the flea, the cyst becomes a tape worm.

(*b*) *Taenia multiceps* (Draaisiektelintwurm).—This is a parasite of dogs and jackals. It grows to one to two feet in length and the last segments are more or less rectangular, half an inch long and one eighth of an inch broad.

This worm is important because its intermediate stage, a bladderworm or cyst, develops in the brains of sheep and cattle and by causing pressure on the brain, gives rise to signs of " draaisiekte ". In a few cases the cyst has also been found in horses and human beings.

The ripe segments of the tape worm are passed out by the dog or jackal in the veld and the eggs are distributed in the grass. If the sheep or cattle swallow the eggs, these hatch out in the duodenum and the small worms burrow into the walls of the intestine. These are carried to various parts of the body by the blood, but they only develop in the brain. The cyst can become as large as a fowl's egg, is thin walled and contains a clear fluid. A number of tape worm heads, the size of manna seed, develop on the inside of the wall.

(*c*) *Taenia hydatigena* (Langneklintwurm).—This is a large tape worm which may grow to fifteen feet in length and is found in the duodenum of dogs and jackals.

Its cyst or bladderworm is found in the abdominal cavity, between the intestines of sheep, goats, cattle, pigs and game. The cyst is usually the size of a fowl's egg, contains a clear fluid and has one tape worm head. This bladderworm is fairly well known. Should a dog swallow one of these cysts, it develops a tape worm.

SIMPTOME.

Lintwurms veroorsaak by honde dikwels vermaering, 'n slordige haarkleed, oormatige eetlus en soms tekens van buikpyn. Lintwurmbesmetting is soms die rede waarom honde en katte hul agterlyf op gras skuur. Jong diere word erger aangetas as oueres en die aantal wurms wat 'n dier het, bepaal natuurlik ook die graad van die siektetekens.

BEHANDELING.

Vir die behandeling van jong hondjies word kamala gebruik, gerieflikheidshalwe in die vorm van tablette (Kamatab) wat oor die tong gestoot word. Vir ouer honde is die beste middel arekolien wat ook in tabletvorm ingegee word (Aretab). Albei middels het ook 'n purgerende uitwerking en verwyder die lintwurms taamlik gou.

Die Komkommerpitlintwurm moet beveg word deur vlooie op die diere en by hul slaapplekke uit te roei, wat met die moderne insektemiddels nie moeilik is nie.

2. RONDEWURMS.

Afgesien van 'n paar soorte wat taamlik seldsaam is, kry ons by honde en katte hoofsaaklik twee groepe rondewurms, nl. askaride en haakwurms, wat algemeen voorkom en allerlei moeilikhede veroorsaak.

Askaride.—Daar is twee soorte wat albei sowat drie duim lank word, omtrent so dik soos 'n vuurhoutjie, liggeel gekleur en spits aan die ente is. Hulle leef in die dunderm van honde en katte.

Die eiers van die wurms kom met die dier se mis na buite en bevat al na 'n paar (3–5) dae volledig-ontwikkelde larwes. As sulke eiers deur katte of honde ingesluk word, raak die diere besmet deurdat die eiers uitbroei en die wurms verder ontwikkel in die dunderm. By één van die twee soorte askaride volg egter nog 'n belangrike verwikkeling. Die larwes wat uitbroei, bly nie in die derm nie, maar dring in die dermwand in en word deur die bloed weggevoer. Hulle bereik allerlei liggaamsdele waar hulle mag kwaaddoen. Die meeste bly egter in die longe steek en breek uit die klein are uit, kom in die lugweë, word opgehoes en weer ingesluk. Nadat hulle so die tweede keer in die derm gekom het, word hulle daar groot.

SIMPTOME.

Hierdie migrasie deur die liggaam is 'n gewone deel van die lewensloop van baie Ascarissoorte soos byvoorbeeld van die soorte wat voorkom by die mens, die vark en die perd, waardeur die longe erg beskadig kan word. In die geval van die hondewurm gebeur dit dikwels dat die larwes, by 'n dragtige teef, die jong hondjies in die baarmoeder bereik. Hulle gaan na die lewer en bly daar tot die hondjies gebore is en begin asemhaal. Dan gaan al die larwes tegelyk na die longe en rig groot skade aan, sodat die hondjies binne 'n paar dae vrek. Dit is dus belangrik om te sorg dat 'n dragtige teef nie aan besmetting blootgestel word nie.

By groter diere veroorsaak askaride armoedigheid, 'n slordige haarkleed, soms maagwerking of verstopping. Die wurms mag vorentoe kruip tot in die maag en word dikwels opgebring. Wurms wat in die derm doodgaan en verteer word, veroorsaak senuweesimptome, sodat die dier opgewonde rondhardloop, of neerslaan, en dit mag selfs lyk of die dier hondsdolheid het.

SYMPTOMS.

Tape worms in dogs frequently cause loss of weight, an untidy coat, ravenous appetite and sometimes signs of abdominal pain. Infection with tape worms is sometimes the cause why dogs and cats rub the anus on grass. Young animals are affected worse than older ones, and the degree of the symptoms naturally depends on the number of worms in the animal.

TREATMENT.

Kamala is used for the treatment of young pups, for convenience in the form of tablets (Kamatab) which can be passed over the tongue. Arecoline, which can also be given in tablet form (Aretab), is the best remedy for older dogs. Both remedies also have a purging action and the tape worms are removed fairly quickly. *Dipylidium caninum* must be combatted by keeping the animals and their bedding, etc., free of fleas. This should not prove difficult if the modern insecticides are used.

2. ROUND WORMS.

Apart from a few kinds which are fairly rare, principally two groups of round worms occur in dogs and cats, viz. ascarids and hookworms.

Ascarids.—There are two kinds, both of which can become about three inches long, are about as thick as a match, light yellow in colour and tapered at the ends. They are found in the duodenum of dogs and cats.

The eggs of the worms pass out with the animal's faeces and after a few (3–5) days contain fully-developed larvae. If these eggs are swallowed by cats or dogs, the animals become infected. The larvae hatch and then grow in the small intestine. One of the ascarids has a different life cycle. The larvae which hatch, do not remain in the alimentary canal but penetrate the walls of this and are carried further by the blood. They reach various parts of the body where they may do harm. The majority, however, become lodged in the lung and burrow through the small bloodvessels, arrive in the respiratory system, are coughed up and swallowed once more. After this second arrival in the alimentary canal, they mature.

SYMPTOMS.

This migration through the body is a common feature in the life cycle of many of the ascarids, e.g. those which are found in human beings, pigs and horses and which can do serious damage to the lungs. In the case of dogs it frequently happens that the larvae reach the young puppies in the womb of a pregnant bitch. The larvae lodge in the liver and remain there until the puppies are born and start breathing. Then all the larvae move simultaneously to the lungs and cause much damage so that the puppies die within a few days. Thus it is important to take care that a pregnant bitch is not exposed to infection.

In larger animals ascarids give rise to a poor appearance, an untidy coat and sometimes diarrhoea. The worms may crawl forward into the stomach and are frequently vomited and worms which die in the alimentary canal may become digested and may cause nervous symptoms such as over-excitability, epileptiform fits and symptoms resembling those of rabies.

3. HAAKWURMS.

Daar is twee soorte wat ook albei in honde en katte voorkom, in die dunderm. Hulle is omtrent 'n kwartduim lank. Die wurms suig baie bloed en veroorsaak gou 'n bloedarmoede sodat die vliese van die oë en die bek bleek word en die dier verswak. Hierdie toestand moet onderskei word van galkoors wat ook bloedarmoede veroorsaak.

Die eiers broei in hierdie geval buite uit en die larwes leef net op klam plekke in die grond of sand. Hulle boor deur die vel van die dier en kom met die bloed na die longe, breek uit die are uit en word ook opgehoes en ingesluk, soos askaridelarwes. In die dunderm word hulle dan groot.

Die aanwesigheid van askaride en haakwurms by honde en katte kan vasgestel word deur die mis mikroskopies te ondersoek.

BEHANDELING.

Teen sowel askaride as haakwurms is tetrachlooretileen 'n uitstekende middel. Dit word die maklikste ingegee in 'n gelatien-kapsule (Tekaps) wat oor die dier se tong gestoot word. As die dier se bek oopgemaak word, sit mens die duim van die linkerhand onder die kakebeen en druk met die ander vingers die wang tussen die agtertande in. Dan kan die dier nie sy bek toemaak nie en kan mens met die regterhand die kapsule oor die tong instoot. Dadelik word die bek toegemaak en effens toegehou, dan sluk die dier die middel in.

VOORBEHOEDING.

Askaride en haakwurms pla die meeste waar diere in hokke of klein kampies gehou word en gevolglik die eiers of larwes ophoop. In die geval van haakwurms kan sout op die grond gegooi en die larwes so doodgemaak word. Askaride-eiers is egter baie taai en al wat help, is om sementvloere te maak wat minstens tweemaal elke week goed skoongemaak word.

Die haakwurmlarwes dring ook in die vel van die mens in, byvoorbeeld by kinders wat in 'n sandhoop speel wat deur katte besmet is. Die larwes dwaal in die vel rond en veroorsaak die toestand wat bekend is as „velmol" of „sandwurm". Dit jeuk geweldig en kan jare lank aanhou. So 'n sandhoop kan ook met sout behandel word, omtrent één pond sout op 'n kubieke jaart sand.

UITWENDIGE PARASIETE BY HONDE.

(*a*) *Die Tropiese Hondebosluis* (*Rhipicephalus sanguineus*).—Dit is 'n betreklik klein bosluis wat hoofsaaklik voorkom op honde wat in hokke gehou word. Die mannetjie is bruin, terwyl die volgesuigde wyfie vaalblou is. Die bene is bruin. Dis 'n driegasheer-bosluis en hy dra galkoors by honde oor.

Honde wat in huise kom, kan soms volgesuigde wyfies van hierdie bosluis daar laat agterbly en hulle kruip dan êrens weg en lê eiers. As die larwes uitkom, loop hulle oral rond en klim ook op meubels, omdat hulle tot 19 maande sonder kos kan leef.

(*b*) *Die gewone Hondebosluis* (*Haemaphysalis leachi*).—Dis die mees algemene hondebosluis in ons land en word deur honde in die veld opgetel. Veral in dorpe waar daar baie honde is en min grasplekke waar die honde speel, word hierdie bosluis soms baie volop.

3. HOOKWORMS.

There are two kinds, both of which are found in the duodenum of dogs and cats. They are about a quarter of an inch long. The worms suck a great deal of blood and soon give rise to aenemia so that the membranes of the eyes and mouth become pale and the animal is weakened. This condition must be distinguished from biliary fever which also causes aenemia.

In this case the eggs hatch outside the body and the larvae are found only in damp places in the ground or sand. They burrow through the skin of the animal, pass with the blood to the lungs, erupt from the bloodvessels and are coughed up and swallowed similar to the larvae of the ascarids. They mature in the duodenum.

The presence of ascarids and hookworms in dogs and cats can be determined by a microscopic examination of the faeces.

TREATMENT.

Tetrachlorethylene is an excellent remedy against ascarids as well as hookworms. It is most easily administered in a gelatine capsule (Tekaps) which is passed over the animal's tongue. When the animal's mouth is opened, the thumb of the left hand is placed under the jawbone and the other fingers press the cheek between the back teeth. This prevents the animal from closing its mouth and the capsule can be passed over the tongue with the right hand. The mouth should be closed immediately and held lightly, for the animal to swallow.

PREVENTION.

Ascarids and hookworms are most troublesome when animals are kept in pens or small runs, with a subsequent accumulation of eggs and larvae. In the case of hookworms, salt can be strewn on the ground and the larvae killed in this way. The eggs of ascarids, however, are most resistant and matters can be improved only by putting down cement floors which can be cleaned thoroughly at least twice a week.

Hookworm larvae can also penetrate the skin of human beings, e.g. children who have played on a sand pile infected by cats. The larvae wander about in the skin and give rise to a condition known as Sandworm. This itches excessively and may exist for years. An infected sandpile can also be treated with salt, approximately one pound of salt per cubic yard of sand.

EXTERNAL PARASITES OF DOGS.

(*a*) *The Tropical Dog Tick* (Rhicicephalus sanguineus).—This is a fairly small tick which is found principally on dogs kept in kennels. The male is brown, the engorged female being a greyish blue. The legs are brown. This is a three host tick and causes biliary fever in dogs.

Dogs sometimes drop engorged females of this tick in the house and these hide and lay their eggs. When the larvae hatch they are very active and may even be found on furniture. They can remain without food for about nineteen months.

(*b*) *The Common Dog Tick*.—The common dog tick (*Haemaphysalis leachi*) is the most common dog tick in this country and is picked up by dogs in the veld. In towns where there are numbers of dogs and few grassy localities where the dogs play, this type of tick becomes very numerous.

Dis 'n klein, bruin bosluis. Die volgesuigde wyfies is ligblou. Kenmerkend is die kort driehoekvormige monddele, voor smal en agter breed. Dis 'n driegasheer-bosluis en dra galkoors oor by honde.

(*c*) *Vlooie.*—Goed bekend. Hulle is die tussengashere van die Komkommerpitlintwurm wat by honde voorkom.

(*d*) *Luise.*—Goed bekend.

BESTRYDING VAN UITWENDIGE PARASIETE.

Hierdie parasiete moet veral op hulle gasheer bestry word. Vir hierdie doel is Lindaan en gewone BHC-preparate, bv. Lindaan Stuifpoeier, Dethex, ens., veral aan te beveel. DDT-poeier (5 of 10 persent) kan vir vlooie gebruik word maar is nie so doeltreffend teen die ander parasiete nie. Dis ook wenslik dat die hokke van honde met hierdie middels bestuif of bespuit word om byvoorbeeld vlooilarwes en bosluislarwes dood te maak.

CHRONIESE NIERONTSTEKING.

Dis 'n siekte veral van ou honde en 'n mens kan byna aanvaar dat alle ou honde tot 'n meerdere of mindere mate daaraan ly.

Talle teorieë oor die oorsaak is al uitgespreek, maar tog bestaan daaromtrent nog geen sekerheid nie.

Die eerste wat 'n mens opmerk is dat die hond—

(1) baie water suip;
(2) baie urineer—die urien is besonder lig van kleur;
(3) effens afval in kondisie;
(4) geneig is om gou moeg te word; en
(5) dat sy hare effens droog en dof word.

Hierdie simptome kan vir maande bestaan voordat dit verder ontwikkel. Dan begin die hond af en toe opbring—later al meer, selfs tussen maaltye. Die hond teer uit, sy tong word bruin, sy tandvleise bloei maklik en taai slym kom in die bek voor. Soms lakseer hy.

Geen doeltreffende behandeling is bekend nie. Raadpleeg 'n veearts.

VERGIFTIGINGS.

Vergiftiging kan toevallig of kwaadwillig wees. Die gifstof wat veral gebruik word is strignien (wolwegif) en tot 'n mindere mate arseen. By jaghonde is die gevaar van vergiftiging moontlik nog groter as by ander honde omdat hulle in die veld beweeg waar vergiftigde aas dikwels vir ongediertes gelaat word.

Strignien.—Hierdie gifstof tas die brein aan, maar beskadig dit nie, en maak die dier baie vatbaar vir enige prikkels sodat hy stuiptrekkings kry.

Die simptome verskyn binne 10–20 minute nadat die gif gevreet is, en miskien nog gouer as die hond water gesuip het. Eers begin hy net vinniger asemhaal en skrikkerig word. As 'n mens met hom praat of hom aanraak of die hande klap, ruk hy. Hierdie reaksie word gou erger sodat hy later neerslaan en al die spiere stokstyf span. Aan die begin duur so 'n stuiptrekking net 'n paar sekondes maar dit word al langer. Na so 'n aanval haal die hond baie vinnig asem en lyk hy uitgeput maar tog nie dooierig nie—die uitputting en vinnige asemhaling is die gevolg van die feit dat die hond gedurende die stuiptrekking nie kan asemhaal nie, omdat die borsspiere ook styf span. Later is die stuiptrekking so erg dat die dier versmoor, nadat hy persblou geword en miskien selfs die tong stukkend gebyt het.

It is a small, brown tick. The engorged females are light blue. The short, triangular mouth parts, narrow in front and broad at the back, are characteristic. It is a three host tick and causes biliary fever in dogs.

(*c*) *Fleas*.—Well known. They are the intermediate hosts of the tape worm (*Dipylidium caninum*) found in dogs.

(*d*) *Lice*.—Well known.

CONTROL OF EXTERNAL PARASITES.

The best method of control is to keep the dogs free of parasites. For this purpose Lindane and ordinary B.H.C. preparations, e.g. Lindane dusting powder, Dethex, etc., are especially recommended. D.D.T. powder (5 per cent or 10 per cent) can be used for fleas but is not as effective for other parasites. It is also advisable to dust or spray the dogs' kennels with these in order to kill the larvae of fleas or ticks.

CHRONIC NEPHRITIS (CHRONIESE NIERONTSTEKING).

This is principally a disease of aged dogs and it can almost be taken for granted that all old dogs suffer from this to a greater or lesser degree.

Numerous theories have been expressed as to the cause of this, but as yet there is no certainty.

The first symptoms are that the dog—

(1) Drinks water excessively;
(2) urinates frequently—the urine being an exceptionally light watery colour;
(3) loses condition slightly;
(4) is inclined to tire easily; and
(5) that its coat becomes slightly dry and dull.

These symptoms may be present for months, before the illness develops further. Then the dog begins to vomit occasionally—later more frequently, even between meals. The dog loses flesh, its tongue becomes brown, the gums bleed easily and there is sticky slime in the mouth. Sometimes the bowels are loose.

No effective treatment is known. Consult a veterinary surgeon.

POISONS.

Poisoning can either be accidental or malicious. The poison most commonly used is strychnine and to a lesser extent, arsenic. The danger of poisoning is possibly greater for hunting dogs than for other dogs, as these hunt in the veld where poisoned bait has frequently been left for vermin.

Strychnine.—This poison affects but does not damage the brain and makes the animal very susceptible to any stimuli, so that it has convulsions.

The symptoms appear within 10 to 20 minutes after the poison has been eaten, and perhaps even sooner if the dog drinks water. At first the dog only breathes rapidly and becomes nervous. It jerks when spoken to or touched or if the hands are clapped. This reaction soon becomes worse, so that the dog falls down with all the muscles rigid. At first a convulsion like this lasts only a few seconds but it soon lasts longer. After an attack the dog breathes very quickly and appears exhausted, but not listless—the exhaustion and accelerated respiration are a result of the fact that the dog cannot breathe during the convulsion, as the chest muscles also become rigid. Later the convulsions are so bad that the animal suffocates, after having shown purplish blue mucous membranes and it may even bite its tongue.

Behandeling.

As die hond nog nie strawwe stuiptrekkings kry nie, gee dadelik 'n braakmiddel, bv. 'n koppie of twee vol sterk, lou soutwater of mostert. Herhaal na 'n minuut of drie indien die hond nie baie goed braak nie. Vir hierdie doel kan 'n inspuiting van apomorfien ($\frac{1}{20}$ste–$\frac{1}{10}$de grein) onder die vel ook gegee word.

Gedurende 'n strawwe stuiptrekking moet kunsmatige asemhaling toegepas word om te verhoed dat die hond sterf. Tussen-in moet hy op 'n baie stil plek, onaangeraak gelaat word omdat die geringste prikkel soos geraas, ens. die aanvalle opwek. Deur kunsmatige asemhaling kan 'n mens die dier selfs vir ure aan die lewe hou, en hom moontlik by iemand kry wat 'n verdowingsmiddel kan toedien.

Om die stuiptrekkings te vermy, moet die hond verdoof word. Vir hierdie doel is veral Nembutal geskik. Die dosis is ongeveer 1 grein per 5 pond gewig en dit word in 'n aar of makliker nog, in die buikholte, ingespuit. Dit hou die dier 'n paar uur aan die slaap en gee die niere die geleentheid om die gif wat reeds geabsorbeer is, uit te skei. As die hond bykom en nog baie strawwe stuiptrekkings kry, is dit soms nodig om weer 'n kleiner dosis van die verdowingsmiddel toe te dien. As al die gif uit die liggaam uitgeskei is, bestaan daar geen gevaar meer nie.

Arseen.—Vergiftiging hiermee kom selde by honde voor. Die kenmerkende simptome is dat die dier skielik herhaaldelik begin opbring en lakseer. Die ontlasting is selfs bloederig. As die dier groot hoeveelhede vreet, vrek hy soms binne 'n paar uur.

Behandeling.

Gee dadelik en selfs elke 4 tot 6 uur daarna 'n half teelepelvol Hypo (natriumtiosulfaat) in 'n bietjie water opgelos, in. Indien moontlik, spuit ook dadelik in die aar, en herhaal na 6–8 uur, 5–10 c.c. van 'n 10 persent Hypo oplossing. Gee daarna elke paar uur deur die bek middels wat die maag- en dermslymvlies beskerm soos Kaolien, Kaopectin, ens.

WONDE.

Verwonding kan op baie maniere plaasvind en die wonde wat ontstaan, kan baie verskil van aard. So word daar dan ook algemeen van bytwonde, snywonde, skeurwonde, ens. gepraat. Verder kan 'n mens te doen kry met vlak of diep wonde en met skoon of besmette wonde, bv. waar grond, ens. die letsel besoedel.

By die behandeling van enige wond is die eerste vereiste dat dit moet rus. Hiermee word bedoel dat dit nie te dikwels gewas, met poeier bestrooi of met salwe gesmeer moet word nie, dat die hond dit nie te veel of gladnie moet lek nie, ens.

'n Vuil, besmette wond moet eerstens gereinig word. Hierdie doel word bereik deur dit versigtig te was met 'n betroubare wond-ontsmettingsmiddel, bv. Steramin, Cetavlon, akri- of euflavinoplossing (1–1,000) of laaste, maar nie minste nie, gewone soutoplossing (1 teelepelvol op 'n pint gekookte water wat afgekoel het dat dit lou is). So 'n soutoplossing besit baie meer waarde as wat 'n mens besef. Sterk oplossings van Dettol, Jeyes, Hycol, Pinex, ens. kan nie juis vir wonde aanbeveel word nie.

TREATMENT.

If the convulsions are not yet severe, an emetic, e.g. one or two cups of strong, lukewarm salt water or mustard, should be administered immediately. This should be repeated after one to three minutes if the dog does not vomit. To produce vomition an injection of apomorphine ($\frac{1}{20}$th–$\frac{1}{10}$th grain) can be given subcutaneously.

During a severe convulsion artificial respiration should be applied to prevent the dog's death. In the intervals between the convulsions, the dog should be left untouched in a very quiet place, as the slightest stimulus such as noise, etc., will cause another convulsion. By applying artificial respiration the animal may be kept alive for hours and thus there is time to take it to some one who can administer a narcotic.

The dog should be anaesthetized to prevent convulsions. Nembutal is particularly suitable for this purpose. The dose is approximately one grain per five pounds weight and the solution is injected into a vein or into the abdominal cavity. This puts the animal to sleep for a few hours and allows the kidneys to excrete the poison already absorbed. If the dog, on regaining consciousness, still has very severe convulsions, it may be necessary sometimes to administer a smaller dose of the narcotic. Once the body is rid of all the poison, there is no further danger.

Arsenic.—Arsenical poisoning seldom occurs in dogs. The characteristic symptoms are that the animal suddenly starts vomiting repeatedly and shows acute diarrhoea. The faeces may be bloodstained. If the animal has swallowed large quantities, death may follow within a few hours.

TREATMENT.

Half a teaspoonful of Hypo (Sodium Thiosulphate), dissolved in a little water, should be given by mouth immediately and even repeated every four to six hours afterwards. If possible, an injection of 5–10 c.c. 10 per cent Hypo solution into the vein should be given immediately and repeated after six to eight hours. Remedies such as Kaolin, Kaopectin, etc., which will protect the mucous membrane of the stomach and intestines, should be given orally every few hours.

WOUNDS.

Injury can occur in numerous ways and the resultant wounds may differ vastly in nature. Thus there are wounds generally known as puncture wounds, cut wounds, lacerated wounds, etc. Further the wound to be dealt with may be superficial or deep, clean or dirty, e.g. soil, etc., may contaminate the wound.

In the treatment of any wound, it is primarily essential that it should be allowed to rest. This means that the wound should not be washed too frequently nor dusted with powder excessively or smeared with ointments, and that the dog should not be allowed to lick the wound too much or at all, etc.

A dirty, infected wound must first be cleansed. This should be done by washing carefully with a reliable wound disinfectant, such as Steramin, Cetavlon, acri- or euflavin solution (1–1,000) or last, but not least, an ordinary salt solution (one teaspoonful to a pint of boiled water, which has cooled until it is lukewarm). A saline solution such as this is of more value than is generally realised. Strong solutions of Dettol, Jey's, Hycol, Pinex, etc., are not recommended for wounds.

Nadat die wond goed gereinig is, word dit met 'n wondpoeier bestuif, bv. Flavoline Wondpoeier, een van die sulfas met penisillien (van aptekers verkrygbaar), ens., of 'n wondolie of wondsalf word daarop gesmeer. Dis belangrik dat 'n mens die middel oral in al die hoekies moet inkry. Diep wonde kan dan met katderm toegenaai word—dit absorbeer later vanself en hoef dus nie verwyder te word nie. Die vel en alle vlak wonde kan met sy of selfs gewone rugare toegewerk word en dié steke moet later verwyder word. As 'n wond toegewerk word, is dit wenslik om dit by die laagste punt oop te laat sodat enige vog wat daarin vorm, kan uitvloei. Indien 'n verband oor die wond aangesit kan word, om besoedeling van buite te verhoed, sal dit 'n voordeel wees. Die ou geloof dat 'n hond se lek so en so goed vir 'n wond is, is absoluut onsin. Dit besmet die wond en verstoor die nodige rus, waarvan reeds melding gemaak is. Voorkom dus sover moontlik dat 'n wond gelek word.

As 'n wond skoon gewas en deeglik behandel is, hoef die verband eers na 3 dae vir die eerste keer afgehaal te word. Die wond moet dan net met die reedsgenoemde ontsmettingsmiddels gewas word as dit absoluut noodsaaklik is. Skoon wonde hoef nie gewas te word nie en 'n skoon roof mag nie verstoor word nie. Bestrooi die wond net daagliks met die poeier of smeer die salf of olie aan en plaas weer, waar moontlik, 'n verband oor om vlieë af te weer en besoedeling te verhoed.

As die wond so erg is dat die hond koorsig en lusteloos word en as die wond baie swel en kwaadaardig lyk, dien vir 'n paar dae sulfamiddels, bv. Aristamid, Sulphamezathine of Sulphatriadpille deur die bek toe of gee daagliks 'n inspuiting van procaine penisillien of penisillien in olie. (Die dosisse van hierdie middels vir 'n volwasse jakkalshond is dieselfde as vir 'n volwasse mens—die apteker kan dus altyd die nodige inligting verskaf.)

AANHANGSEL.

Vir die klub wat geïnteresseerd is om ook sy eie klein nood-apteek uit te rus, word die volgende aanbeveel:—

Instrumente.

Lawement-spuit
Onderhuidse-spuit.
Ontleedmes.
Pinset.
Pot (5 pinte).
Primus-stofie.
Skêr.
Slangbytuitrusting.
Termometer (rektum-).

Medisyne, ens.

Agricura omloopsalf.
Aptekersparaffien.
Aristamid-natriumoplossing.
Aristamid-pille.
Aspirin-pille.
Brandspiritus.
D.D.T.-poeier (5 persent of 10 persent).
Dubbel Benhex-poeier.
Epsomsout.
Gesteriliseerde water.
Hypo (natriumtiosulfaat).
Jodiumoplossing.
Kasterolie.
Lampolie.
M. & B. 693-pille.
Olyfolie.
Ontsmettingsmiddels (Dettol, Pinex, ens.)
Ontwurmingspille (Kamatab en Tekaps).
Oogdruppels.
Penisillien-oogsalf.
Penisillien-salf.
Phenamedine (5 persent oplossing).
Procaine penisillien (300,000 eenhede).
Sinksalf.
Sulfaguanidien.
Tafelsout.
Vaseline.
Verband (1 dm. en 1½dm. breed).
Watte.
Wondpoeier.

Once the wound has been cleansed, it must be dusted with a wound powder, e.g. Flavoline wound powder, one of the sulphas plus penicillin (obtainable from chemists), etc., or a wound oil or a wound ointment may be applied. It is essential that the remedy should be spread over all parts of the wound. Deep wounds should be sutured with gut—this absorbs of its own and need not be removed. The skin and all superficial wounds can be stitched with silk or even ordinary cotton and these stitches must later be removed. When a wound is closed, it is advisable to leave it open at the lowest point so that any fluid forming there, will drain. It is an advantage if the wound can be bandaged to prevent external contamination. The old belief that the licking of the wound by the dog is beneficial, is a fallacy. This contaminates the wound and disturbs the necessary rest of which mention has already been made. Therefore prevent the licking of wounds as far as possible.

If the wound has been properly cleansed and carefully attended to, the dressing need not be removed until after three days. The wound must then only be washed with the disinfectants already mentioned if it is absolutely essential. Clean wounds need not be washed and a clean scab should not be disturbed. The wound should be dusted daily with the powder or the ointment or oil applied and bandaged, if possible, to keep off flies and prevent infection.

If the wound is of such a nature that the dog becomes feverish and listless and if it is badly swollen and angry looking, sulpha remedies such as Aristamid, Sulphamezathine or Sulphatriad pills should be given by mouth or a daily injection of procaine penicillin or penicillin in oil should be administered for a few days. (The doses of these remedies for fullgrown foxhounds are the same as for adult humans, thus a chemist will always be able to give the required information.)

APPENDIX.

For the Club interested in having its own small emergency dispensary the following items are suggested:—

INSTRUMENTS.

Enema.
Forceps.
Hypodermic syringe.
Pot (5 pints).
Primus stove.
Scalpel.
Scissors.
Snake-bite outfit.
Thermometer (rectal).

MEDICINE, ETC.

Agricura Ringworm Ointment.
Aristamid Tablets.
Aristamid Sodium Solution.
Aspirin Tablets.
Bandages (1 inch and 1½ inch).
Castor Oil.
Cotton Wool.
D.D.T. Powder (5 per cent or 10 per cent).
Deworming Tablets (Kamatab and Tekaps).
Disinfectants (Dettol, Pinex, etc.).
Double Benhex Powder.
Epsom Salt.
Eye-drops.
Hypo (Sodium Thiosulphate).
Iodine Solution.
Liquid Paraffin.
M. & B. 693 Tablets.
Methylated Spirits.
Olive Oil.
Paraffin.
Penicillin Eye-ointment.
Penicillin Ointment.
Phenamidine (5 per cent solution).
Procaine Penicillin (300,000 u.).
Sterilised Water.
Sulphaguanidine.
Table Salt.
Vaseline.
Wound Powder.
Zinc Ointment.